DOCUMENT RESUME

ED 139 686 SO 010 003

| | |
|---|---|
| TITLE | Intellectual Development and School Achievement of Youths 12-17 Years: Demographic and Socioeconomic Factors. Data from the National Health Survey, Series 11, Number 158. Vital and Health Statistics. |
| INSTITUTION | Health Services Administration (DHEW/PHS), Rockville, Md. |
| PUB DATE | Dec 76 |
| NOTE | 73p. |
| AVAILABLE FROM | Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (DHEW Publication No. HRA-77-1640, $1.35 paper cover) |
| EDRS PRICE | MF-$0.83 HC-$3.50 Plus Postage. |
| DESCRIPTORS | *Academic Achievement; Achievement Tests; Arithmetic; Data Analysis; Demography; Income; *Intellectual Development; *Measurement; National Competency Tests; National Surveys; Parent Education; Predictor Variables; Reading; Secondary Education; Socioeconomic Influences; Sociology; Statistical Analysis; Surveys; Tables (Data); *Youth |

ABSTRACT

The report presents information on intellectual development and school achievement of youths in relation to selected socioeconomic and demographic factors. Estimates were based on data collected by the National Center for Health Statistics from 1966-70. The survey sample consisted of 6,768 adolescents aged 12-17 years. Measurement instruments were the Vocabulary and Block Design subtests of the Wechsler Intelligence Scale for Children (WISC) and the Reading and Arithmetic subtests of the Wide Range Achievement Test (WRAT). Performance on these tests is discussed in terms of parental education, family income, place of residence, progress through school, race, and geographic region. Findings indicated that the educational level of the head of household was most highly correlated with the WISC and WRAT scores and that there was also a strong relationship between family income and test scores. Gross differences in average scores for youths from the two major racial groups were observed, with the average score for white youths being higher than that for black youths on each of the four subtests. Additional research was suggested. Tables, explanation of statistical data and standard errors of estimates are included. (Author/DB)

**********
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
**********

VITAL AND HEALTH STATISTICS
DATA FROM THE NATIONAL HEALTH SURVEY
ED139686

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

NATIONAL CENTER FOR
NCHS
HEALTH STATISTICS

# Intellectual Development and School Achievement of Youths 12-17 Years:

## Demographic and Socioeconomic Factors

SD CTO 013

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
Health Resources Administration

2

**Library of Congress Cataloging in Publication Data**

Hitchcock, Dale C.

Intellectual development and school achievement of youths 12-17 years.

(Vital and health statistics: Series 11, Data from the National Health Survey; no. 158) (DHEW publication; no. (HRA) 77-1640)

Includes bibliographic references.

Supt. of Docs. no.: HE 20.6209:11/15

1. Educational tests and measurements. 2. Students' socio-economic status. 3. Academic achievement. I. Oliver, Lincoln I., joint author. II. Title. III. Series: United States. National Center for Health Statistics. Vital and health statistics: Series 11, Data from the National Health Survey, Data from the health examination survey; no. 158. IV. Series: United States. Dept. of Health, Education, and Welfare. DHEW publication; no. (HRA) 77-1640. [DNLM: 1. Intelligence tests—in adolescence. 2. Achievement—In adolescence. 3. Demography. 4. Socioeconomic factors. 5. Child development. W2 N148vk no. 158] RA407.3.A347 no. 158 [LB1131] 373.1'2'6 76-608028 ISBN 0-8406-0067-4



For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-Price $1.35

MAY 4 1977

Data from the
NATIONAL HEALTH SURVEY

Series 11
Number 158

# Intellectual Development and School Achievement of Youths 12-17 Years:

## Demographic and Socioeconomic Factors

Intellectual development and school achievement of youths 12 through 17 years of age as measured by the Vocabulary and Block Design subtests of the Wechsler Intelligence Scale for Children (WISC) and the Reading and Arithmetic subtests of the Wide Range Achievement Test (WRAT) are discussed in terms of education of parent; family income; place of residence in terms of size, type, and rate of population change; progress through school; race; and geographic region.

DHEW Publication No. (HRA) 77-1640

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

Health Resources Administration
National Center for Health Statistics
Rockville, Md. December 1976

# NATIONAL CENTER FOR HEALTH STATISTICS

DOROTHY P. RICE, *Director*

ROBERT A. ISRAEL, *Deputy Director*
JACOB J. FELDMAN, Ph.D., *Associate Director for Analysis*
GAIL F. FISHER, *Associate Director for the Cooperative Health Statistics System*
ELIJAH L. WHITE, *Associate Director for Data Systems*
ROBERT C. HUBER, *Acting Associate Director for Management*
PETER L. HURLEY, *Associate Director for Operations*
JAMES M. ROBEY, Ph.D., *Associate Director for Program Development*
ALICE HAYWOOD, *Information Officer*

## DIVISION OF HEALTH EXAMINATION STATISTICS

ARTHUR J. McDOWELL, *Director*
JEAN-PIERRE HABICHT, M.D., Ph.D., *Special Assistant to Director*
HAROLD J. DUPUY, Ph.D., *Psychological Adviser*
LINCOLN OLIVER, *Chief, Psychological Branch*
ROBERT S. MURPHY, *Chief, Survey Planning and Developing Branch*

## COOPERATION OF THE BUREAU OF THE CENSUS

In accordance with specifications established by the National Health Survey, the Bureau of the Census, under a contractual agreement, participated in the design and selection of the sample, and carried out the first stage of the field interviewing and certain parts of the statistical processing.

Vital and Health Statistics-Series 11-No. 158

DHEW Publication No. (HRA) 77-1640

*Library of Congress Catalog Card Number 76-608028*

# CONTENTS


| | Page |
|---|---|
| Introduction | 1 |
| The Psychological Test Battery | 2 |
| The Wechsler Intelligence Scale | 3 |
| Background | 3 |
| Short Forms of the WISC | 3 |
| The Wide Range Achievement Test | 3 |
| Findings | 4 |
| Raw Scores and Standard Scores | 4 |
| Background Factors | 4 |
| Education of Parent and Family Income | 5 |
| Type of Place of Residence | 6 |
| Rate of Population Change of Place of Residence | 6 |
| Progression Through School | 7 |
| Race | 14 |
| Geographic Region | 16 |
| Summary and Conclusions | 17 |
| References | 18 |
| List of Detailed Tables | 20 |
| Appendix I. Statistical Notes | 41 |
| The Survey Design | 41 |
| Reliability | 42 |
| Extent of Missing Test Results and Imputation Procedures | 43 |
| Sampling and Measurement Error | 43 |
| Hypothesis Testing | 44 |
| Small Categories | 44 |
| Appendix II. Standard Errors of Estimates | 49 |
| Appendix III. Demographic and Socioeconomic Variables and Related Terms | 64 |

| SYMBOLS | |
|---|---|
| Data not available | ... |
| Category not applicable | ... |
| Quantity zero | - |
| Quantity more than 0 but less than 0.05 | 0.0 |
| Figure does not meet standards of reliability or precision | * |

# INTELLECTUAL DEVELOPMENT AND SCHOOL ACHIEVEMENT OF YOUTHS 12-17 YEARS: DEMOGRAPHIC AND SOCIOECONOMIC FACTORS

Dale C. Hitchcock and Lincoln I. Oliver, *Division of Health Examination Statistics*

## INTRODUCTION

This report presents information on levels of intellectual development and school achievement of U.S. youths aged 12-17 years in relation to selected socioeconomc and demographic factors. These estimates are based on data collected by the Health Examination Survey, which was conducted from March 1966 to March 1970 by the National Center for Health Statistics (NCHS).

Intellectual development and school achievement of sample youths were measured by the Vocabulary and Block Design subtests of the Wechsler Intelligence Scale for Children (WISC) and the Reading and Arithmetic subtests of the Wide Range Achievement Test (WRAT), respectively. Findings on these youths according to sex, age, and grade in school have been published.[1,2] In this report, relationship of performance on these tests to parent's education; family income; place of residence in terms of size, type, and rate of population change from 1950 to 1960; progress through school; race; and geographic region is examined, using normalized scale scores constructed from the results of the four subtests.

The Health Examination Survey, a major program of the NCHS, was authorized under the National Health Survey Act of 1956 and subsequent amendments as a continuing Public Health Service activity.[3] Complementing other NCHS programs aimed at assessing the health status of the American people, the Health Examination Survey collects and analyzes data gathered by direct physical examinations, tests, and measurements performed on a probability sample of the U.S. population. The survey is conducted as a series of separate cross-sectional programs referred to as "cycles." Each cycle is limited to a specific segment of the U.S. population and to certain aspects of the health of these people. Since 1960, three surveys, or cycles, have been completed. Cycle I was concerned with adults aged 18-79 years in the noninstitutionalized population of the United States and was completed in 1962.[4,5] Cycle II, a survey of children aged 6-11 years, was completed in 1965;[6,7] and Cycle III, which was completed in 1970,[8] focused on youths 12-17 years of age. For the Cycle III survey of adolescents, on which this report is based, a probability sample of the 12- through 17-year-old segment of the noninstitutionalized population of the United States was selected and examined. Field survey operations began in March 1966 and ended in March 1970. Of the 7,514 adolescents selected in the sample, 6,768 were examined for a response rate of 90 percent. Because of the sample design, adjustment for nonresponse, and weighting procedures used, examination results may be considered representative of the approximately 23 million noninstitutionalized U.S. youths 12-17 years of age at the time of the survey.[3]

Each sample person was administered a 3-hour, single-visit examination in a mobile examination center specially constructed for the Health Examination Survey. The examination focused primarily on factors related to biological and psychological aspects of growth and development. It included examinations by a physician and a dentist, tests administered by a psychologist, and a variety of additional tests and measurements performed by health technicians. To provide comparable data on growth and development and on health characteristics throughout childhood and adolescence, many of the tests and measurements carried out on youths were the same as those carried out on children aged 6-11 during the previous cycle, with some modifications for the difference in ages. In addition, information specifically relevant to adolescent health and behavior was collected.

To supplement data obtained from the direct examination of youths, several questionnaires were administered as a part of the survey. Among them were a household questionnaire administered by interviewers from the U.S. Bureau of the Census to obtain demographic and socioeconomic information and two medical histories on the sample person, one completed by the parents and the other by the adolescent himself at the examination center. For those adolescents in school, information about grade placement, teachers' ratings of behavior and adjustment, and details of any health problems known to the teacher were requested from the school last attended.

All information was collected under conditions of confidentiality. More detailed information about the survey plan, the sample design, examination content, and the operation of the survey of adolescents can be found in appendix I and in a previous report.[8] Sampling errors associated with the population estimates discussed are shown in the detailed tables for totals and in appendix II for subgroups. Definitions of some of the demographic, socioeconomic, and related variables used in this report are listed in appendix III.

## THE PSYCHOLOGICAL TEST BATTERY

The content of the psychological test battery included in both the survey of children and the survey of adolescents was determined after extensive consultation with psychologists from the academic community and the National Institute of Mental Health. By using essentially the same battery of tests for youths as that used for children, it was believed possible to assess certain aspects of intellectual and, to some extent, emotional growth and development on a comparable basis throughout childhood and adolescence.

The 70-minute battery contained measures of intellectual development (both verbal and performance), school achievement, and aspects of personality development. The Vocabulary and Block Design subtests of the WISC and a modified version of the Goodenough-Harris Drawing Test were the principal measures of intellectual development used. Two subtests of the Wide Range Achievement Test (WRAT) were included to provide estimates of school achievement in the basic skills of oral reading and arithmetic computation. Five cards of the Thematic Apperception Test (TAT) were included in an attempt to measure some aspects of personality as well as oral speech and communication. Finally, to assess the level of illiteracy, the Brief Test of Literacy, developed for the survey under a contract with the Educational Testing Service of Princeton, New Jersey, was administered to each sample youth. The development of this test has been described in an earlier report.[9]

A study evaluating the test battery as it was administered in the children's survey, which did not include the Brief Test of Literacy but was otherwise virtually identical to the test battery employed in the present study, was conducted on a contractual basis by Dr. S. B. Sells of the Institute of Behavioral Research, Texas Christian University.[10] That study involved a review of the literature pertaining to research and evaluation of the tests, offered a basis for recommendations concerning references that could be appropriately made about the test results, and provided a suggestion that additional research was necessary for deciding on the proper use of the data to be collected.

An additional contractual study relating specifically to the WISC was completed by Jane Mercer and Joyce Smith of the University of California at Riverside.[11] This analysis evaluated the use of the Vocabulary and Block Design

subtests as a basis for estimating Full Scale Scores among children from differing socioeconomic levels and ethnic groups. It also examined the amount and direction of error likely to occur if these subtests were used to estimate rates of retarded intellectual development in those populations.

To further study the use of the WRAT as a measure of school achievement, the National Center for Health Statistics contracted with K. Warner Schaie, formerly of West Virginia University, for a special validation study. The findings of that study have been published.[12] Schaie concluded that the WRAT, because of its substantial correlation with two comprehensive tests of school achievement (The Stanford Achievement Test and the Metropolitan Achievement Test) is a satisfactory brief instrument for estimating school achievement.

The field testing procedures for both the WISC and the WRAT during the survey of adolescents are outlined in the two previous reports on test findings by age and sex.[1,2] The tests were administered by psychologists who had at least a master's degree and who had had experience in the administration of psychological tests. Both test forms were given in accordance with the standard WISC and WRAT manuals. All test forms were reviewed and checked as part of the comprehenesive quality control program of the Health Examination Survey. The numbers of missing or unusable test records for the 6,768 youths included in the survey are shown in table I of appendix I, according to age and sex.

## THE WECHSLER INTELLIGENCE SCALE

### Background

The WISC, published in 1949, extended the well-known Wechsler scales into the age range 5-15 so that intellectual development of adolescents could be measured.[10,13] Since its publication, the WISC has been the subject of extensive investigation; it has also been used widely in schools and clinics as an individual measure of general intellectual development.[10]

Much has been written about the concept of intelligence, and the attempts to define it are numerous.[14] For the purposes of this report, it is enough to focus on the concept of intelligence implicit in the Wechsler scales. That concept, embodied in the WISC, assumes an aggregate, or global, capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment.[13,15,16]

The WISC consists of 12 subtests (six verbal and six performance), two of which are treated as supplementary and are not routinely used. An important innovation in the Wechsler scales was the use of the *deviation intelligence quotient.* This measure, which is considered a superior alternative to the *mental age* concept, evaluates test performance on the basis of distributions of scores of representative samples of persons of comparable chronological age.

### Short Forms of the WISC

Time limitations did not permit administration of the full WISC in addition to the other tests and measurements selected for the appraisal of growth and development of adolescents. Thus, only two subtests of the WISC, the Block Design and the Vocabulary, were included in the test battery. These were selected to serve as a short-form test from which estimates of Full Scale WISC test scores could be computed. Besides providing a general index of intellectual development, the two subtests can also be interpreted separately as measures of verbal and performance (nonverbal) aspects of intellectual development.

A number of investigators have assessed the efficiency and accuracy of various combinations of two or more subtests of the WISC in estimating Full Scale Scores.[17-33] These studies have been discussed in the previous report on WISC findings from the survey of adolescents.[2] All available evidence supported the choice of the Vocabulary and Block Design subtests as constituting the best available dyad on which to establish an overall index.

However, while the estimated Full Scale Score is deemed valid and appropriate for the analysis of group statistics in a research setting such as the Health Examination Survey, its use as the sole instrument in the comprehensive assessment of intellectual functioning in clinical settings is obviously not being advocated.[11]

## THE WIDE RANGE ACHIEVEMENT TEST

When plans were being made for a health survey of the U.S. population 6-17 years of age,

it was decided that an assessment of education achievement would be relevant because many developmental and psychological problems first come to the attention of teachers, physicians, parents, and others as "learning" or "school" problems. Although less widely known and used than some comprehensive achievement test batteries, the Wide Range Achievement Test (WRAT) met the survey's requirements for both brevity and applicability to the entire age range of the target population. The choice was supported by published data and by the opinion of some clinicians to the effect that the WRAT could be accepted as a good predictor of performance on more traditional achievement tests.[4]

The WRAT was developed in 1936 by Jastak and Bijou as a tool for studying achievement in the basic school subjects of reading (word recognition and pronunciation), written spelling, and arithmetic computation. The first edition and a revision in 1946 had a range of achievement measurement from kindergarten to college for each of the three subtests.[5] The 1965 edition[a] retained the three subtests, but each was represented by separate scales at two levels.[3,5] Level I was designed for children between the ages of 5 years 0 months and 11 years 11 months, and Level II was intended for persons from 12 years 0 months to adulthood. At both levels, the Reading subtest consists of recognizing and naming letters and pronouncing words arranged in order of increasing difficulty; the Spelling section involves copying marks that resemble letters, writing one's name, and writing single words as they are dictated; and the Arithmetic subtest requires counting, reading number symbols, solving oral problems, and performing written computations normally taught in schools. The WRAT manual provides tables for converting raw scores on the three subtests to grade equivalents, percentiles, and standard scores.

[a]In a previous report on WRAT findings in the HES children's program,[6] it was reported that a 1963 revision was used. This was a provisional edition eventually published as the 1965 revision with only slight changes in the word order of the Reading subtest. The 1963 provisional edition of the Reading and Arithmetic subtests was used in the survey of youths.

## FINDINGS

### Raw Scores and Standard Scores

Raw scores on both the WISC and the WRAT increased with age and education of the youths as measured by grade in school. Generally on the WISC, mean raw scores for boys exceeded those for girls. Girls achieved higher mean raw scores on the WRAT Reading subtest, but there was no significant difference according to sex on the WRAT Arithmetic subtest. For both the WISC and the WRAT, mean raw score differences according to sex tended to decrease for youths in the older age groups and in the higher grades. These and other findings with respect to sex, age, and grade of the youths are reported in detail in previous reports.[1,2]

Mean raw scores and their standard deviations and standard errors are shown in table 1 for certain of the socioeconomic or demographic categories to be discussed. In order to facilitate comparisons of performance between groups and among test results, the raw scores on each subtest were converted to normalized standard scores with a mean of 50 and a standard deviation of 10 (T scores), using cumulative percentage distributions. This was done for each year of age by 4-month intervals and for males and females, separately, to eliminate the effects of age and sex. Some slight irregularities encountered during the standardization process and assumed to be due to sampling variability were found at the extremes of the distributions and were reduced by graphic smoothing procedures. Average T scores are presented in tables 2 and 3 according to demographic and socioeconomic factors.

The T score of the two subtests of the WISC and WRAT, respectively, were summed and set equal to a mean of 100 and a standard deviation of 15.0. These composite scores are used as indexes of intellectual development (WISC) and educational attainment (WRAT).

### Background Factors

The demographic and socioeconomic variables selected for this report from information gathered during the Health Examination Survey were considered to be the best available indicators of the living conditions or types of environ-

ments in the United States from 1966 to 1970 that would be of primary interest in assessing intellectual development or school achievement.

It should be noted that psychological test data were gathered in the survey ultimately for the purpose of relating performance in these areas to other measures of growth and development. Because of the focus of the survey and certain limitations involved in any attempt to adequately describe an adolescent's background and environment for the purpose of studying their effects on test scores, this report must be confined to descriptive analyses of gross relationships involving background factors and performance on these tests.

The scores on the subtests proved to be related to each other, and education of parent and family income were the factors found to be more closely correlated with performance on the subtests (table A). The correlation coefficients for parent's education and the scores on the four subtests were on levels close to those reported for children 6 through 11 years of age (in Cycle II) of the Health Examination Survey.[34,35]

The relationship of these primary factors to performance varied according to section of the country. Income and education had more influence on tests scores obtained for the South, and less influence on scores obtained for the Midwest (table B).

Distributions of youths 12-17 years of age in the U.S. population according to family income, education of parent, race, geographic region, and place of residence (urban-rural) are shown in appendix I, tables II and III.

*Education of parent and family income.*— Education of head of household can be taken as a rough indicator of the general intellectual environment in which the adolescent was raised. A more complete analysis of the effect of the educational level of parents on their offspring should consider data for more than one generation, but sufficient reliable information was not available. Such information is especially important when considering patterns of changes in test scores by parent's educational level according to racial grouping.

The survey data demonstrate a direct relation-

Table A. Correlation matrix of T-score equivalents of raw scores on subtests of WISC and WRAT and six background factors

| Subtests and background factors | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Subtests** | | | | | | | | | | |
| WISC Vocabulary . . . . (1) | 1.00 | | | | | | | | | |
| WISC Block Design . . . (2) | 0.52 | 1.00 | | | | | | | | |
| WRAT Reading . . . . . (3) | 0.74 | 0.50 | 1.00 | | | | | | | |
| WRAT Arithmetic . . . . (4) | 0.63 | 0.53 | 0.68 | 1.00 | | | | | | |
| **Background factors** | | | | | | | | | | |
| Education of parent . . . (5) | 0.48 | 0.35 | 0.44 | 0.38 | 1.00 | | | | | |
| Family income . . . . . (6) | 0.44 | 0.35 | 0.43 | 0.40 | 0.57 | 1.00 | | | | |
| Race[1] . . . . . (7) | -0.29 | -0.27 | -0.31 | -0.31 | -0.20 | -0.30 | 1.00 | | | |
| Size of place . . . . . (8) | 0.08 | 0.03 | 0.09 | -0.01 | 0.16 | 0.14 | 0.15 | 1.00 | | |
| Rate of population increase . . . . . (9) | 0.13 | 0.11 | 0.13 | 0.08 | 0.23 | 0.26 | 0.10 | -0.29 | 1.00 | |
| Number of persons under 21 in household . . . (10) | -0.23 | -0.12 | -0.18 | -0.16 | -0.14 | -0.13 | 0.18 | 0.07 | -0.05 | 1.00 |

[1]Numerical values assigned: white - 1, black - 2.

Table B. Correlation coefficients and related standard errors for overall WISC and WRAT scores for youths 12-17 years, by family income, education of parent, and geographic region : United States, 1966-70

| Test and geographic region | Family income | | Education of parent | |
|---|---|---|---|---|
| | r | SE | r | SE |
| Intellectual development (WISC COMPOSITE) | | | | |
| Northeast | .34 | 0.05 | .41 | 0.03 |
| Midwest | .29 | 0.05 | .32 | 0.03 |
| West | .41 | 0.06 | .45 | 0.08 |
| South | .58 | 0.02 | .58 | 0.02 |
| School achievement (WRAT COMPOSITE) | | | | |
| Northeast | .37 | 0.04 | .38 | 0.02 |
| Midwest | .30 | 0.04 | .32 | 0.03 |
| West | .40 | 0.05 | .39 | 0.06 |
| South | .56 | 0.03 | .56 | 0.03 |

ship between level of education attained by the head of the household in which the examined youth resided and that youth's level of intellectual development and school achievement. Scores on both the WISC and WRAT subtests increased with the number of years of education completed by the head of household (figure 1). (This was the father for 80 percent of all youths examined.) The mean scores for youths with parents who had achieved any given level of education are significantly higher than those whose parents had fewer years of formal education.

Table 4 shows the effects of both family income and parental education on WISC and WRAT for the total population. As expected, the data show that adolescents whose parents had more formal education and those whose parents had higher incomes performed better on the WISC and WRAT. Data on youths from family units of various sizes are shown in table 5 according to family income and education of parent. Adolescents from the larger families in the lower socioeconomic groupings obtained lower scores on both the WISC and the WRAT. Thus it is seen that, in general, scores on these tests tend to be directly related to family income (figure 2).

*Type of place of residence.*—Adolescents residing in certain urban communities scored higher on both the WISC and the WRAT than those living in some other places (tables 6 and 7). Higher average scores were obtained by adolescents residing in urbanized areas with populations of 1-2.9 million than by those residing in urbanized areas with populations of under 250,000 persons or by those residing in rural areas. When adjustment is made for family income and education of parent, these differences disappear.

*Rate of population change of place of residence.*—The rate of population change from 1950 to 1960 was used as an indicator of the social and economic stability of the area in which the adolescent resided. It is likely, for example, that an area undergoing rapid popula-

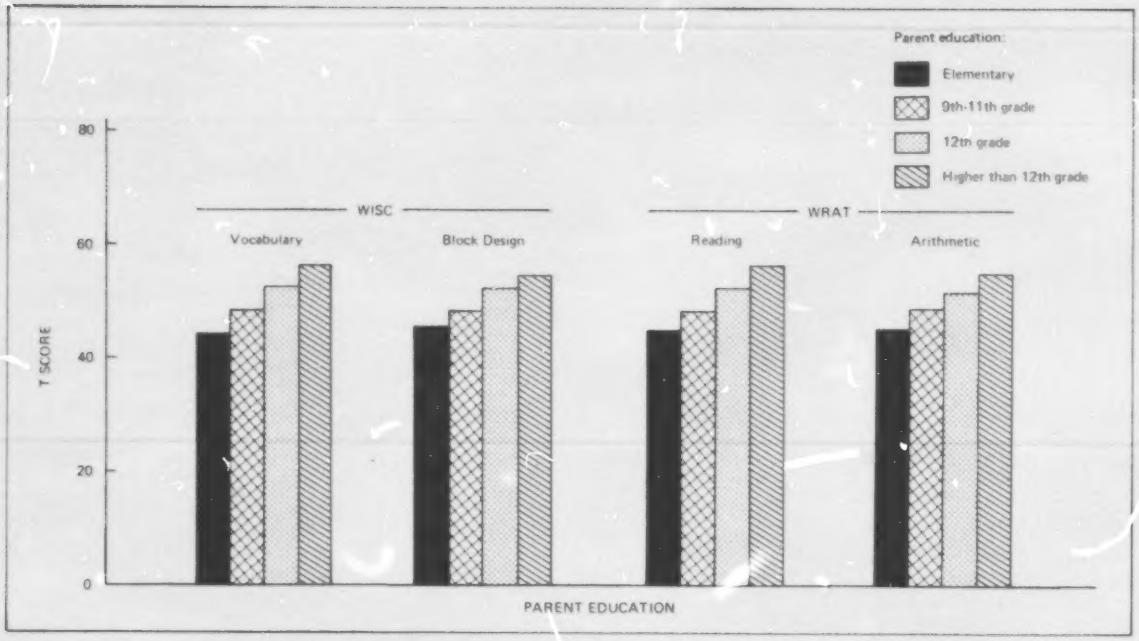


Figure 1. Mean T scores for youths 12-17 years on selected subtests of the WISC and WRAT, by education of parent: United States, 1966-70.

tion growth would have an expanding economy which would provide adequate support for beneficial community facilities and services. Conversely, an area undergoing a decline in population would be faced with diminishing employment opportunities and social resources.

The relationship of population change to performance on the WISC and WRAT is demonstrated in figure 3 and table 8. Adolescents who resided in areas undergoing population losses received lower scores on both the WISC and the WRAT than those residing in areas undergoing greater than average population increases. When partial correlation coefficients were computed to determine the degree of association between population change and scores made on the WISC and the WRAT while controlling for the effects of parent education and income, the values of the coefficients were reduced to virtually zero.

*Progression through school.*—Performance on the subtests of the WISC and WRAT in relation to progress through school was studied by computing the average standard scores for youths in three groups, determined by the relation of actual grade in school to the modal grade for the age of the youth (figure 4). This method was forced since it was not possible to organize the youths 12-17 years of age into groups to reasonably represent more than one or two of the six school grade levels to which most of them were assigned. The modal level for youths 12 years of age was the seventh grade, in which 55 percent of them were located; the modal grade for the 13-year-old youths was the eighth; and so forth.

Youths who were above the modal grade for their respective ages achieved higher scores on each of the four subtests for each of the 12 income-education categories than youths who were below the modal grade did (table 9). The same was true for youths according to place of residence (an urban-rural distinction and a rate of population change classification), race, and geographic region (tables 10 and 11). The difference in average scores according to relative grade level was greater for the WRAT Reading

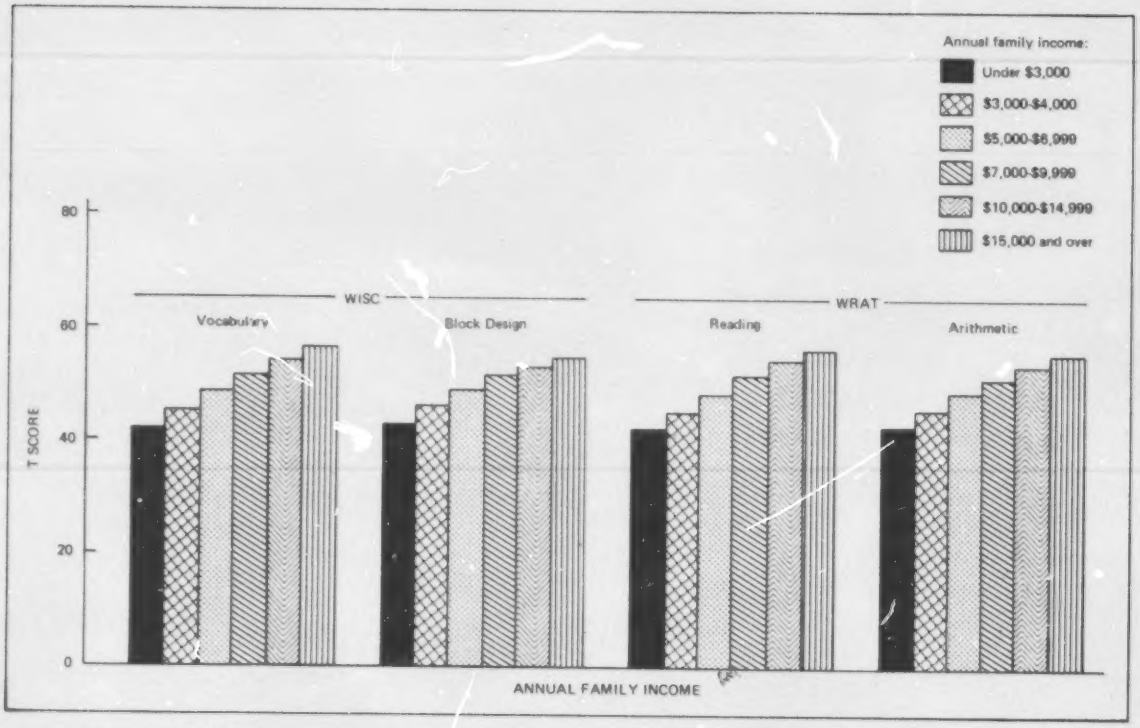


Figure 2. Mean T scores for youths 12-17 years on selected subtests of the WISC and WRAT, by annual family income: United States,

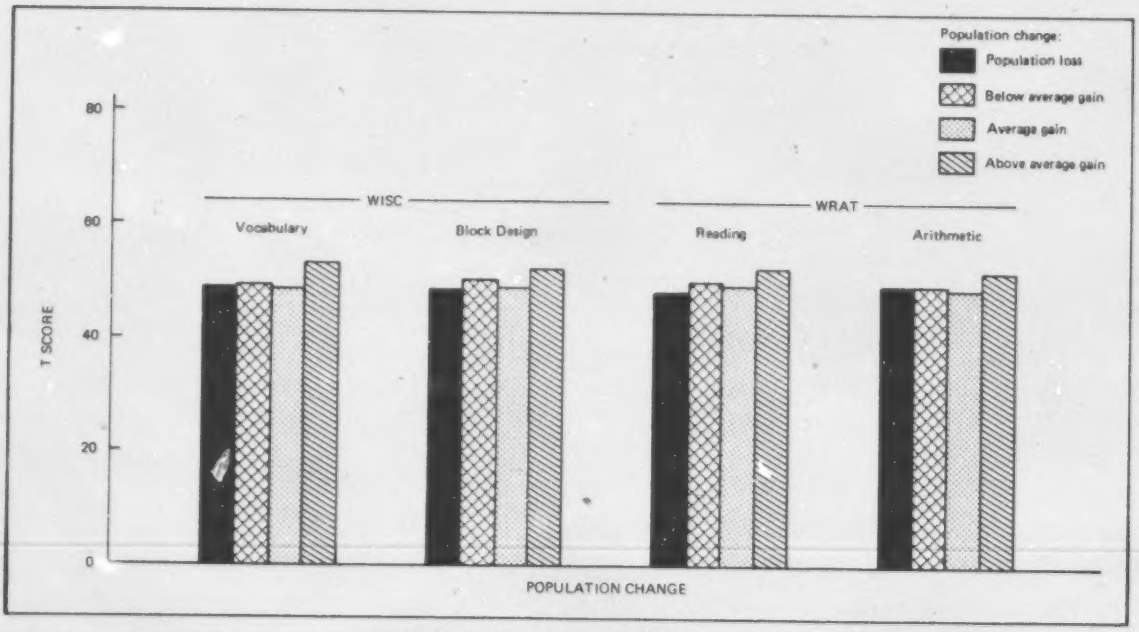


Figure 3. Mean T scores for youths 12-17 years on selected subtests of the WISC and WRAT, by rate of change in population of area of residence from 1950 to 1960: United States, 1966-70.

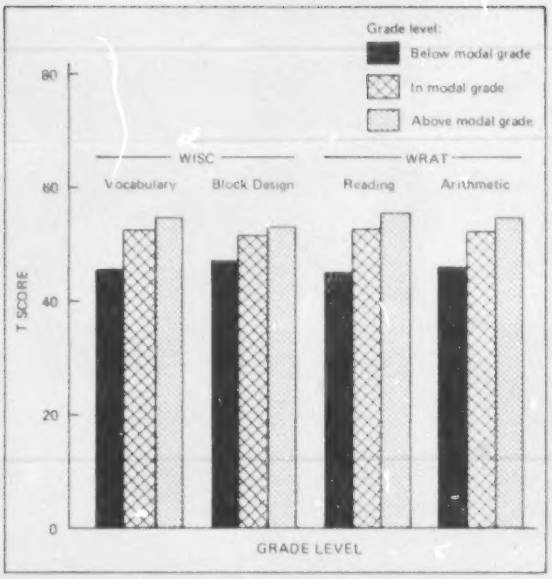


Figure 4. Mean T scores for youths 12-17 years on selected subtests of the WISC and WRAT, by grade level with respect to age: United States, 1966-70.

subtest for each of three broad income groups and for three of the four groupings according to education of parent (table C). The difference was largest for the low-income group and for the low-education groups on each of the four subtests. On the other hand, among the four subtests, the smallest differences in average scores according to grade level were observed for the WISC Block Design (nonverbal) subtest. Differences were consistently larger in urbanized areas than in smaller urban and rural areas, especially with respect to the WRAT Reading subtest. As measured from 1950 to 1960, there were considerably smaller differences in average scores on the four subtests according to relative grade level in places of increasing population, than in places where the population was declining.

Rate of progress through school, which was shown to bear a distinct relationship to performance on the various subtests, reflects many combinations of strong influences related to demographic characteristics, socioeconomic factors, and to certain political or social decisions (figures 5 and 6). The proportions of youths who were reported as having skipped grades (1 percent) or repeated grades (16 percent) were so low as to suggest that, in comparison with other observed influences, those administrative procedures had but a limited effect in determining the resultant position of the youth in the structure of academic classes relative to his age.

Distributions of the youths by type of early school attended are presented according to selected demographic characteristics or socioeconomic factors in table 12. About one-third of the youths attended neither nursery school nor kindergarten, and around 9 percent attended both. Attendance at both nursery school and kindergarten proved to be definitely related to education of parent and family income. Data show that the higher the level of parental education, the larger the proportion of youths that attended both nursery school and kindergarten; and the higher the level of family income, the larger the proportion of youths that attended both or one of these early schools.

Proportionately fewer youths in rural areas than in urban areas attended nursery school or kindergarten; and a larger proportion of youths in places with expanding populations than of those in places with declining populations attended one or both of these early schools. Over two-thirds of the youths from the South had not attended either nursery school or kindergarten, compared with about one-fourth of the youths in the Northeast and West, and almost one-fifth of the youths in the Midwest.

These extreme groups (those who attended both nursery school and kindergarten and those who attended neither) obtained scores on the four subtests that fell on opposite ends of the scale, with those who attended both having the higher average scores (tables 13 and 14). The largest average difference in scores associated with early schooling was related to the WISC Vocabulary subtest. On all four subtests, the effect was greater for white youths than for black youths, and it was greater in the South than in other regions of the country, particularly the Midwest (table D).

Table C. Differences between average T scores of youths 12-17 years who were above and who were below the modal grade for their ages, by family income, selected subtests of the WISC and WRAT, and education of parent: United States, 1966-70[1]

| Subtest and education of parent | Total | Annual family income | | |
|---|---|---|---|---|
| | | Less than $5,000 | $5,000-$9,999 | $10,000 or more |
| | T-score points[2] | | | |
| **All youths, 12-17 years** | | | | |
| WISC Vocabulary | 8.8 | 8.4 | 7.4 | 5.0 |
| WISC Block Design | 6.0 | 6.3 | 5.5 | 2.5 |
| WRAT Reading | 10.4 | 9.5 | 9.2 | 7.4 |
| WRAT Arithmetic | 8.8 | 8.8 | 7.7 | 5.4 |
| **Education of parent** | | | | |
| Elementary school: | | | | |
| WISC Vocabulary | 8.4 | 7.8 | 7.8 | (1.6) |
| WISC Block Design | 6.1 | 5.3 | 6.0 | (2.5) |
| WRAT Reading | 9.4 | 8.7 | 8.8 | (5.9) |
| WRAT Arithmetic | 9.4 | 8.3 | 9.1 | 7.0 |
| 9th-11th grade: | | | | |
| WISC Vocabulary | 7.6 | (6.1) | 6.8 | 5.4 |
| WISC Block Design | 5.0 | 8.1 | (3.3) | (3.9) |
| WRAT Reading | 8.6 | 8.5 | 7.4 | 6.7 |
| WRAT Arithmetic | 6.2 | 6.0 | (3.8) | 5.8 |
| 12th grade: | | | | |
| WISC Vocabulary | 6.1 | 7.2 | 6.2 | 5.1 |
| WISC Block Design | 3.6 | 5.7 | 4.6 | (1.3) |
| WRAT Reading | 8.8 | 9.2 | 8.7 | 8.5 |
| WRAT Arithmetic | 7.5 | 10.5 | 7.6 | 5.8 |
| Higher than 12th grade: | | | | |
| WISC Vocabulary | 5.8 | 5.3 | 5.4 | 5.6 |
| WISC Block Design | 3.7 | * | * | * |
| WRAT Reading | 7.9 | 9.0 | 8.5 | 7.3 |
| WRAT Arithmetic | 5.5 | 8.2 | 5.8 | 4.8 |

[1]These T-score points were calculated as follows: average T scores for youths who were above modal grade minus average T score for those who were below modal grade.

[2]Except as indicated by being enclosed in parentheses, the values shown are statistically significantly greater than zero at the 1-percent probability level.

The age at which youths started first grade was found to be a reliable predictor of grade in relation to modal level, more so than the other available variables; and it appears to represent the primary mechanism, among those available or discernible, by which the influence of back-

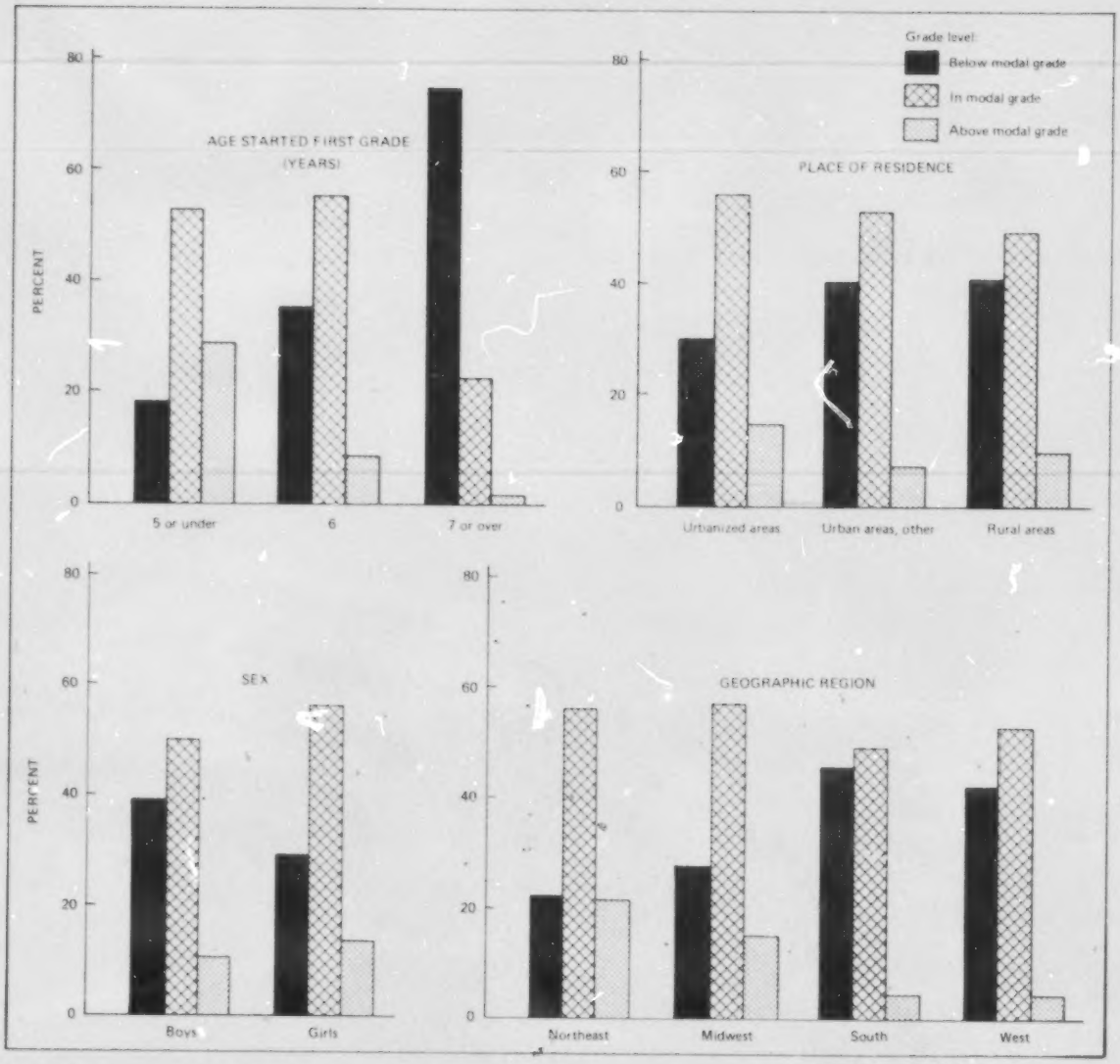


Figure 5. Percent of youths 12-17 years, by grade level with respect to age and selected demographic characteristics: United States, 1966-70.

ground factors may be assessed in connection with progress through school and performance on these tests. Youths whose parents had fewer years of formal education and those whose family income was relatively low started school later than other youths (table 12). Enrollment in the first grade at the age of 7 or over occurred more frequently in the South than in the other geographic regions, even after an adjustment for differences in the distribution of parents with respect to income and education.

The comparison of average scores for youths who were in grades above the modal level primarily because they started at an early age with those for youths below the modal grade because of having started late reveals some effects of the factors associated with age starting first grade and performance on these tests. The

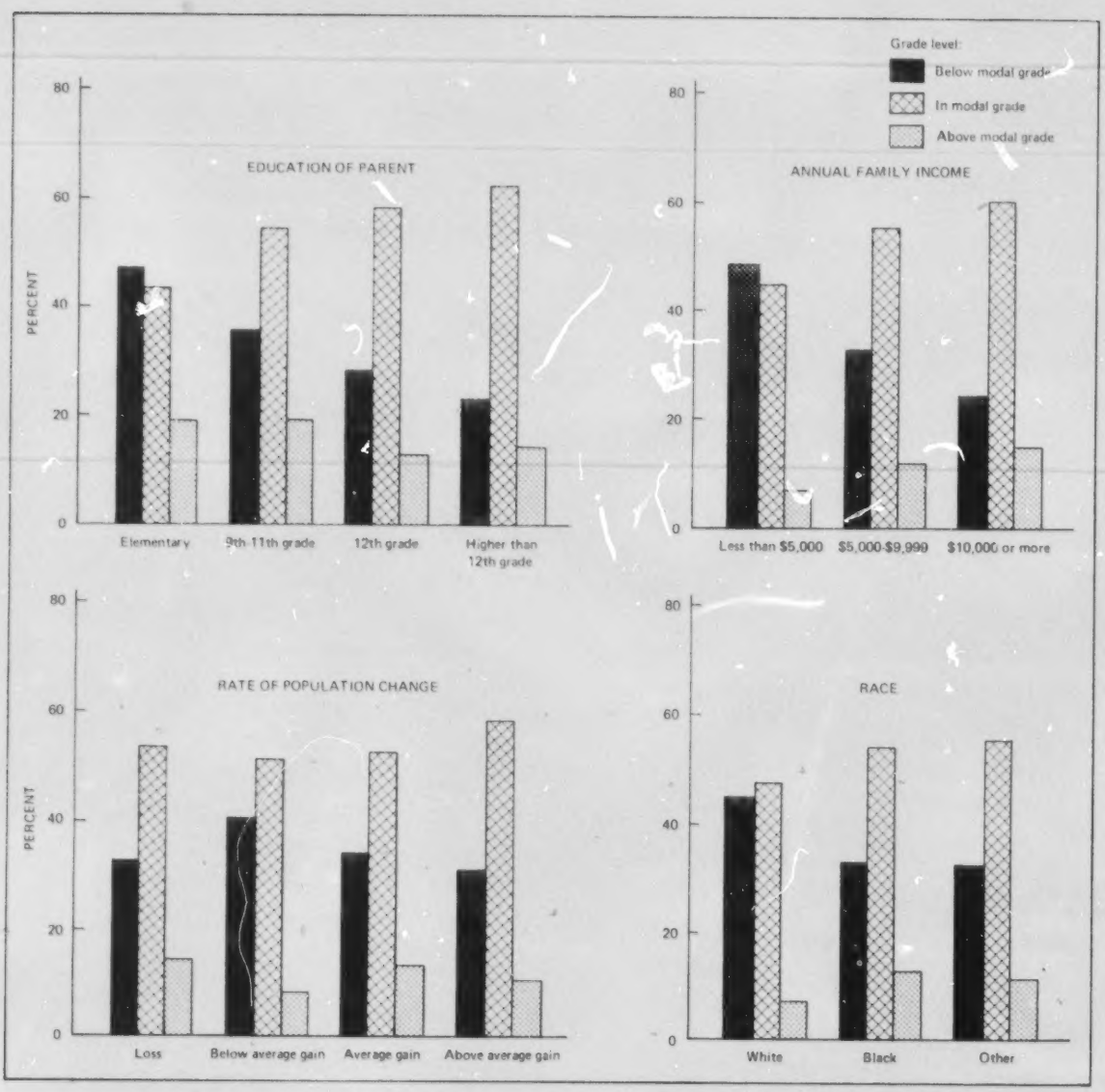


Figure 6. Percent of youths 12-17 years, by grade level with respect to age and selected socioeconomic characteristics: United States, 1966-70.

differences between the early starters and the late starters with regard to average scores on the four subtests ranged from about 1 to 1½ standard deviations (table E). Youths who started first grade at 5 years or under showed the greatest positive difference in performance on the WISC Vocabulary subtest among the four given, compared with youths who started at 7 or

Table D. Differences between average T scores of youths 12-17 years who attended both nursery school and kindergarten and those who attended neither, by selected subtests of the WISC and WRAT and selected demographic or socioeconomic characteristics: United States, 1966-70[1]

| Demographic or socioeconomic characteristic | WISC | | WRAT | |
|---|---|---|---|---|
| | Vocabulary | Block Design | Reading | Arithmetic |
| | T-score points[2] | | | |
| All youths, 12-17 years | 8.7 | 5.5 | 7.7 | 5.8 |
| **Education of parent** | | | | |
| Elementary school | 7.0 | 3.2 | 3.9 | 3.4 |
| 9th - 11th grade | 3.9 | 3.9 | (3.3) | (1.6) |
| 12th grade | (1.5) | (–1.2) | (1.1) | (0.6) |
| Higher than 12th grade | 3.9 | 2.6 | 4.8 | (1.3) |
| **Annual family income** | | | | |
| Less than $5,000 | 5.1 | (2.8) | 2.8 | (1.2) |
| $5,000-$9,999 | 4.6 | 3.4 | 3.2 | 3.4 |
| $10,000 or more | 5.2 | (1.9) | 5.1 | (2.0) |
| **Place of residence** | | | | |
| Urbanized areas | 8.3 | 5.4 | 7.6 | 6.4 |
| Urban, other | 7.0 | 3.0 | 6.1 | 5.5 |
| Rural areas | 9.8 | 6.1 | 8.3 | 5.8 |
| **Rate of population change** | | | | |
| Loss | 10.4 | 7.0 | 8.8 | 6.4 |
| Below average gain | 8.7 | 4.6 | (6.7) | 5.5 |
| Average gain | 8.0 | 5.5 | 8.0 | 6.6 |
| Above average gain | 6.1 | 2.8 | 5.7 | 4.3 |
| **Race** | | | | |
| White | 8.2 | 4.8 | 7.2 | 5.1 |
| Black | 4.8 | (3.1) | (3.1) | (1.9) |
| **Geographic region** | | | | |
| Northeast | 9.0 | 4.5 | 7.8 | 6.1 |
| Midwest | (4.5) | (2.4) | 5.2 | (2.0) |
| South | 10.5 | 7.2 | 9.4 | 8.1 |
| West | (6.9) | (3.2) | 4.4 | 3.4 |

[1]These T-score points were calculated as follows: average T score for youths who attended both nursery school and kindergarten minus average T score for youths who did not attend either.

[2]Except as indicated by being enclosed in parentheses, the values shown are statistically significantly greater than zero at the 1-percent probability level.

Table E. Differences between average T scores of youths 12-17 years who were above the modal grade due to starting school at 5 years or under and those who were below the modal grade due to starting school at 7 years or over, by selected subtests of the WISC and WRAT: United States, 1966-70[1]

| Subtest | T score—all youths 12-17 years | | Difference in average score: early starters and late starters[2] |
|---|---|---|---|
| | Average | Standard deviation | |
| | T-score points | | |
| WISC | | | |
| Vocabulary | 50.0 | 10.0 | 14.3 |
| Block Design | 50.0 | 10.0 | 9.5 |
| WRAT | | | |
| Reading | 50.0 | 10.0 | 14.1 |
| Arithmetic | 50.0 | 10.0 | 11.9 |

[1]These T-score points were calculated as follows: average T score for subgroup of youths who were above modal grade minus average T score for subgroup of youths who were below modal grade.

[2]These values are statistically significantly greater than zero at the 1-percent probability level.

over, for each demographic or socioeconomic grouping (table F). Average scores on the four subtests according to age starting first grade are presented for the various demographic or socioeconomic categories of youths in tables 15 and 16.

*Race.*—In this analysis, race is a term not intended to be considered in the anthropologic sense, but rather as a means of identifying two main groups of people—white and black. These are terms by which people identified themselves, with each group being characterized by its own combination of persons from the various demographic or socioeconomic subgroups and being distinguished from each other by variation in historical, social, political, and psychological development over the last century.

Overall, the scores for black youths were lower than the corresponding scores for white youths on the four subtests of the WISC and the WRAT (figure 7). For both major racial groups, the patterns of increasing scores with increasing family income and education of parent were observed (table 17). When differences in the distribution of the groups by parental education were taken into account, the value of the measure of association between test scores and race (the correlation coefficient) was reduced by approximately one-third from the unadjusted absolute level of around 0.3. The differences between average T scores for the two groups of youths in the various income-education categories should not be interpreted without recognition of the fact that classifying the two groups according to income and education of parent may not be adequate for producing sufficiently comparable groups with respect to living environment, circumstances, or atmosphere related to intellectual growth or achievement.

Although any given number of years of education does not necessarily indicate the same level of intellectual achievement among all segments of the U.S. population, it is believed that there is less equivalence in this measure for the racial groupings than for the others. Further, level of income or years of education is a reliable measure of socioeconomic status only to the extent that there exists the freedom to utilize such assets to produce an environment that corresponds. With respect to race, social restrictions and traditions have imposed more limits for black than for white people in this connection. Consistent with this idea is the observation that at the lower end of the income-education scale, where parents have little or no formal education, the differences in mean scores for white and black adolescents were much less than they are in the overall population. For example, when the head of the household had less than 5 years of schooling, there were no significant differences in the results on the WISC Verbal subtest between the two racial groups. More directly relevant are the varied effects that the difference in historical experience has had on those factors associated with progression through school (aside from differences in the quality of schools), which have been shown to

Table F. Differences between average T scores of youths 12-17 years who were 5 years or under and those who were 7 years or over when they started first grade, by selected subtests of the WISC and WRAT and selected demographic or socioeconomic characteristics: United States, 1966-70[1]

| Demographic or socioeconomic characteristic | WISC | | WRAT | |
|---|---|---|---|---|
| | Vocabulary | Block Design | Reading | Arithmetic |
| | T-score points[2] | | | |
| All youths, 12-17 years | 9.5 | 6.0 | 7.8 | 6.6 |
| **Grade level for age** | | | | |
| Above modal grade | • | • | • | • |
| In modal grade | 4.8 | 3.0 | (2.8) | (2.7) |
| Below modal grade | 4.4 | 2.3 | (1.4) | (1.3) |
| **Education of parent** | | | | |
| Elementary school | 8.1 | 4.5 | 6.0 | 5.1 |
| 9th - 11th grade | 7.3 | 3.9 | 6.4 | 6.6 |
| 12th grade | 4.9 | (2.6) | 4.2 | (3.1) |
| Higher than 12th grade | 6.7 | 4.4 | 5.1 | 3.8 |
| **Annual family income** | | | | |
| Less than $5,000 | 6.7 | 3.7 | 4.9 | 3.4 |
| $5,000-$9,999 | 6.5 | 4.3 | 5.4 | 5.0 |
| $10,000 or more | 6.6 | 2.7 | 4.4 | 3.9 |
| **Place of residence** | | | | |
| Urbanized areas | 7.9 | 4.5 | 6.6 | 4.5 |
| Urban, other | 12.8 | 5.8 | 8.9 | 10.3 |
| Rural areas | 9.4 | 7.8 | 8.6 | 8.3 |
| **Rate of population change** | | | | |
| Loss | 9.8 | 9.1 | 8.7 | 8.1 |
| Below average gain | 11.7 | (4.7) | (7.6) | 6.2 |
| Average gain | 6.9 | 4.9 | 6.8 | (6.1) |
| Above average gain | 8.3 | 4.1 | 8.0 | 6.2 |
| **Race** | | | | |
| White | 9.7 | 5.9 | 8.1 | 6.9 |
| Black | 6.4 | 5.3 | 5.5 | 4.8 |
| **Geographic region** | | | | |
| Northeast | 9.8 | 5.9 | 8.0 | 6.6 |
| Midwest | (4.3) | (2.8) | 3.9 | (2.0) |
| South | 8.6 | 6.4 | 7.2 | 6.8 |
| West | 11.5 | 5.9 | 8.1 | 7.9 |

[1]These T-score points were calculated as follows: average T score for youths who started first grade when they were 5 years old or younger minus average T score for youths who started at 7 years of age or older.

[2]Except as indicated by being enclosed in parentheses, the values shown are statistically significantly greater than zero at the 1-percent probability level.

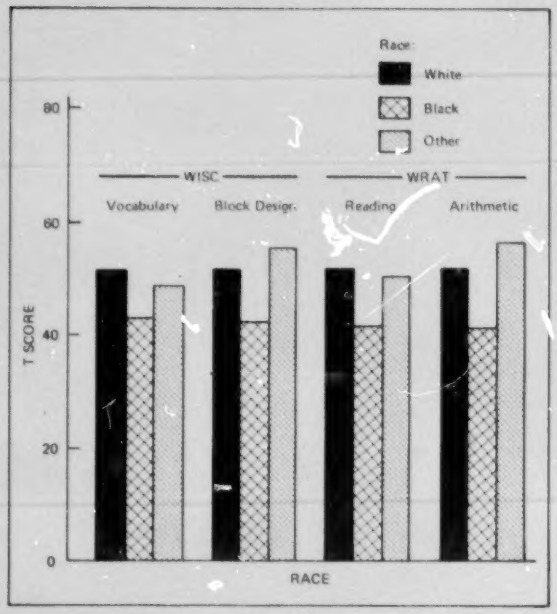


**Figure 7. Mean T scores for youths 12-17 years on selected subtests of the WISC and WRAT, by race: United States, 1966-70.**

be definitely related to performance on these tests of intellectual development and school achievement.

*Geographic region.*—The differences in the average scores for youths in the four geographic regions for which data are shown in tables 18 and 19 and figure 8 reflect mainly the variations in the distribution of these subgroups of the population with respect to the primary background factors, family income, and education of parent (see appendix I, tables II and III). Some effects of the varying combinations of these influences are evident in the comparisons presented in tables G and H. For white youths, the urban-rural distinction so far as family income and educational attainment of parent are concerned is less pronounced in areas outside the South than in the South; and the scores, particularly on the Reading test, reflect this difference. For black youths, 48 percent of whom resided in the South, no such difference was observed. Other sources of differences in performance of the youths from the various sections of the country could be found in the

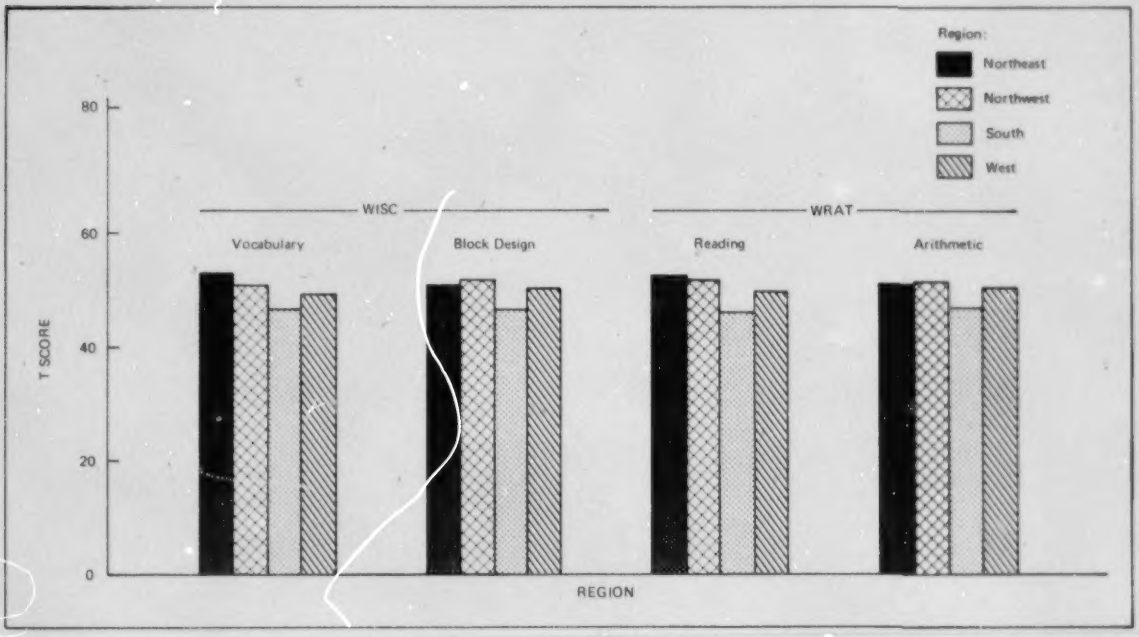


**Figure 8. Mean T scores for youths 12-17 years on selected subtests of the WISC and WRAT, by geographic region: United States, 1966-70.**

Table G. Average T-score equivalents of raw scores on two specified WISC subtests for youths 12-17 years, by race and area of residence: United States, 1966-70

| Area of residence | Vocabulary | | Block Design | |
|---|---|---|---|---|
| | White | Black | White | Black |
| | Average T score | | | |
| All regions | 51.2 | 42.3 | 51.2 | 42.0 |
| Urban areas | 52.0 | 42.9 | 51.7 | 42.6 |
| Rural areas | 49.9 | 40.0 | 50.3 | 39.9 |
| South[1] | 48.6 | 40.5 | 48.7 | 39.8 |
| Urban areas | 51.8 | 41.1 | 51.0 | 40.2 |
| Rural areas | 46.4 | 39.6 | 47.0 | 39.2 |
| Other regions | 51.8 | 43.9 | 51.8 | 44.1 |
| Urban areas | 52.0 | 44.1 | 51.8 | 44.2 |
| Rural areas | 51.4 | 41.4 | 51.7 | 43.0 |

[1]The South is the only single region for which sample size permits reliable estimates to be made for an urban-rural comparison by race.

Table H. Average T-score equivalents of raw scores on two specified WRAT subtests for youths 12-17 years, by race and area of residence: United States, 1966-70

| Area of residence | Reading | | Arithmetic | |
|---|---|---|---|---|
| | White | Black | White | Black |
| | Average T score | | | |
| All regions | 51.3 | 41.6 | 51.3 | 41.1 |
| Urban areas | 52.3 | 41.9 | 51.8 | 41.4 |
| Rural areas | 49.8 | 40.4 | 50.6 | 39.8 |
| South[1] | 48.4 | 39.6 | 49.5 | 39.6 |
| Urban areas | 51.3 | 39.6 | 52.2 | 40.1 |
| Rural areas | 46.3 | 39.6 | 47.6 | 38.7 |
| Other regions | 52.0 | 43.4 | 51.7 | 42.5 |
| Urban areas | 52.4 | 43.4 | 51.7 | 42.3 |
| Rural areas | 51.3 | 43.7 | 51.9 | 43.9 |

[1]The South is the only single region for which sample size permits reliable estimates to be made for an urban-rural comparison by race.

differing social, economic, and political conditions which influenced progression through school.

## SUMMARY AND CONCLUSIONS

This report contains statistical information on performance by youths 12-17 years of age in the noninstitutionalized population of the United States on the Vocabulary and Block Design subtests of the Wechsler Intelligence Scale for Children (WISC) and on the Reading and Arithmetic subtests of the Wide Range Achievement Test (WRAT), in relation to selected demographic characteristics and socioeconomic factors. These tests were administered from 1966 to 1970 to a sample of the 23 million such adolescents as part of a national health survey of youths which focused on their growth and development, in order to assess intellectual development and school achievement.

Of the 7,514 adolescents selected in the sample, 6,768, or 90 percent, participated in the survey. Because of the sample design, adjustment for nonresponse, and weighting procedures used in the survey, findings for these adolescents may be considered to be representative of the target population with respect to age, sex, race, region, and certain other socioeconomic and demographic characteristics. Data by sex and age have been published in two previous reports.[1,2]

Normalized T scores, or standard scores, are presented according to parent's education; family income; place of residence in terms of size, type, and rate of population change during 1950-1960; progress through school; race; and geographic region. Measures of the association between test scores and the selected demographic and socioeconomic variables are also presented.

The educational level of the parent who was considered to be the head of the household was the variable most highly correlated with the WISC and WRAT scores. The adolescents whose parents had received more years of formal education performed better on the tests than other youths did.

There was also a strong relationship between family income and test scores. Youths from homes with relatively high family incomes

achieved higher scores than those from families with lower incomes did.

With respect to the rate of population change from 1950 to 1960, which was used as an indicator of community stability, youths residing in those areas experiencing above-average gains in population consistently obtained higher scores than youths from communities with declining populations.

The youths' performance on the four subtests by grade in school in relation to age, by whether or not they attended nursery school or kindergarten, and age at which they started first grade is described according to selected demographic or socioeconomic characteristics.

Gross differences in average scores for youths from the two major racial groups were observed, with the average score for white youths being higher than that for black youths on each of the four subtests. For both groups the performance on the subtests and family income and education of parent exhibited the same pattern of quantitative relationship, and differences in distribution of the racial groups according to these background factors accounted for some, but not all, of the overall differences in scores. It is suggested that classification of the different races according to the income and education information available may not have produced corresponding groups that were sufficiently comparable with respect to the real background factor for which it would be desirable to control—environment, circumstances, or atmosphere for fostering intellectual growth—and that this could account for at least some of the residual differences.

## REFERENCES


[1] National Center for Health Statistics: Reading and arithmetic achievement among youths 12-17 years as measured by the Wide Range Achievement Test, United States. *Vital and Health Statistics.* Series 11-No. 136. DHEW Pub. No. (HRA) 74-1618. Health Resources Administration. Washington. U.S. Government Printing Office, Feb. 1974.

[2] National Center for Health Statistics: Intellectual development of youths as measured by a short form of the Wechsler Intelligence Scale, United States. *Vital and Health Statistics.* Series 11-No. 128. DHEW Pub. No. (HRA) 74-1610. Health Resources Administration. Washington. U.S. Government Printing Office, Sept. 1973.

[3] National Center for Health Statistics: Origin, program, and operation of the U.S. National Health Survey. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 1-No. 1. Public Health Service. Washington. U.S. Government Printing Office, Apr. 1965.

[4] National Center for Health Statistics: Plan and initial program of the Health Examination Survey. *Vital and Health Statistics.* Series 1-No. 4. DHEW Pub. No. (HRA) 74-1038. Health Resources Administration. Washington. U.S. Government Printing Office, reprinted Nov. 1973.

[5] National Center for Health Statistics: Cycle I of the Health Examination Survey: Sample and response, United States, 1960-1962. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 11-No. 1. Public Health Service. Washington. U.S. Government Printing Office, Apr. 1964.

[6] National Center for Health Statistics: Plan, operation, and response results of a program of children's examinations. *Vital and Health Statistics.* Series 1-No. 5. DHEW Pub. No. (HSM) 73-1251. Health Services and Mental Health Administration. Washington. U.S. Government Printing Office, Oct. 1967.

[7] National Center for Health Statistics: Sample design and estimation procedures for a National Health Examination Survey of children. *Vital and Health Statistics.* Series 2-No. 43. DHEW Pub. No. (HRA) 74-1005. Health Resources Administration. Washington. U.S. Government Printing Office, reprinted Aug. 1973.

[8] National Center for Health Statistics: Plan and operation of a Health Examination Survey of U.S. youths 12-17 years of age. *Vital and Health Statistics.* Series 1-No. 8. DHEW Pub. No. (HRA) 75-1018. Health Resources Administration. Washington. U.S. Government Printing Office, Sept. 1969.

[9] National Center for Health Statistics: Development of the Brief Test of Literacy. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 27. Public Health Service. Washington. U.S. Government Printing Office, Mar. 1968.

[10] National Center for Health Statistics: Evaluation of psychological measures used in the Health Examination Survey of children ages 6-11. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 15. Public Health

Service. Washington. U.S. Government Printing Office, Mar. 1966.

[11]National Center for Health Statistics: Subtest estimates of the WISC Full Scale IQ's for children. *Vital and Health Statistics.* Series 2-No. 47. DHEW Pub. No. (HSM) 72-1047. Health Services and Mental Health Administration. Washington. U.S. Government Printing Office, Mar. 1972.

[12]National Center for Health Statistics: A study of the achievement test used in the Health Examination Surveys of persons aged 6-17 years. *Vital and Health Statistics.* PHS Pub. No. 1000-Series 2-No. 24. Public Health Service. Washington. U.S. Government Printing Office, June 1967.

[13]Wechsler, D.: *Wechsler Intelligence Scale for Children, Manual.* New York. The Psychological Corporation, 1949.

[14]McCandless, B.R.: *Adolescents: Behavior and Development.* Hinsdale, Illinois. The Dryden Press, 1970.

[15]Wechsler D.. *The Measurement and Appraisal of Adult Intelligence* (4th ed.) Baltimore. The Williams and Wilkins Company, 1958.

[16]Matarazzo, J.D.: *Wechsler's Measurement and Appraisal of Adult Intelligence* (5th ed.). Baltimore. The Williams and Wilkins Company, 1972.

[17]Finley, C.J., and Thompson, J.: An abbreviated Wechsler Intelligence Scale for Children for use with the educable mentally retarded. *Am.J.Ment.Defic.* 63:473-480, 1958.

[18]Greenmun, R., *Abbreviated Forms of the Wechsler Intelligence Scale for Children.* Unpublished master's thesis. Texas Christian University, Aug. 1965.

[19]Simpson, W.H., and Bridges, C.C., Jr.: A short form of the Wechsler Intelligence Scale for Children. *J.Clin.Psychol.* 15(4):424, Oct. 1959.

[20]Wight, B.W., and Sandry, M.: A short form of the Wechsler Intelligence Scale for Children. *J.Clin.Psychol.* 18(2):166, Apr. 1962.

[21]Mumpower, D.L.: The fallacy of the short form. *J.Clin.Psychol.* 20(1):111-3, Jan. 1964.

[22]Silverstein, A.B.: Validity of WISC short forms at three age levels. *J.Consult.Psychol.* 31:635-6, Dec. 1967.

[23]Enburg, R., Rowley, V.N., and Stone, B.: Short forms of the WISC for use with emotionally disturbed children. *J.Clin.Psychol.* 17(3):280-284, July, 1961.

[24]McKerracher, D.W., and Watson, R.A.: Validation of a short form WISC with clinic children. *Brit.J.Educ.Psychol.* 38:205-8, June 1968.

[25]Nickols, J., and Nickols, M.: Brief forms of the WISC for research. *J.Clin.Psychol.* 19(4):425, Oct. 1963.

[26]Schwartz, L., and Levitt, E.E.: Short forms of the Wechsler Intelligence Scale for Children in the educable, noninstitutionalized mentally retarded. *J.Educ.Psychol.* 51(4):187-190, Aug. 1960.

[27]Thompson, J.M., and Finley, C.J.: An abbreviated WISC for use with gifted elementary school children. *California J.Educ.Res.* 14(4):167-177, Sept. 1963.

[28]Yalowitz, J.M., and Armstrong, R.G.: Validity of short forms of the Wechsler Intelligence Scale for Children. *J.Clin.Psychol.* 11(3):275-277, July 1955.

[29]Silverstein, A.B.: Estimating full scale IQ's from WISC short forms. *Psychol.Rep.* 20: Suppl:1264, June 1967.

[30]Silverstein, A.B.: A short short form of Wechsler's scales for screening purposes. *Psychol.Rep.* 21:842, Dec. 1967.

[31]Silverstein, A.B.: A short short form of the WISC and WAIS for screening purposes. *Psychol.Rep.* 20:682, Apr. 1967.

[32]Silverstein, A.B.: Reappraisal of the validity of a short form of Wechsler's scales. *Psychol.Rep.* 26(2):559-561, Apr. 1970.

[33]Silverstein, A.B.: Reappraisal of the validity of WAIS, WISC, and WPPSI short forms. *J.Consult.Clin. Psychol.* 34(1): 12-14, Feb. 1970.

[34]National Center for Health Statistics: Intellectual development of children by demographic and socioeconomic factors, United States. *Vital and Health Statistics.* Series 11-No. 110. DHEW Pub. No. (HSM) 72-1012. Health Services and Mental Health Administration. Washington.U.S. Government Printing Office, Dec. 1971.

[35]Jastak, J.F., and Jastak, S.R.: *The Wide Range Achievement Test, Manual of Instructions,* Rev. Ed. Wilmington, Del. Guidance Associates, 1965.

[36]National Center for Health Statistics: School achievement of children by demographic and socioeconomic factors, United States. *Vital and Health Statistics.* Series 11-No. 109. DHEW Pub. No. (HSM) 72-1011. Health Services and Mental Health Administration. Washington. U.S. Government Printing Office, Nov. 1971.

[37]National Center for Health Statistics: Replication: An approach to the analysis of data from complex surveys. *Vital and Health Statistics.* Series 2-No. 14. DHEW Pub. No. (HSM) 73-1269. Health Services and Mental Health Administration. Washington. U.S. Government Printing Office, Apr. 1966.

[38]National Center for Health Statistics: Pseudoreplication: Further evaluation and application of the balanced half-sample technique. *Vital and Health Statistics.* Series 2-No. 31. DHEW Pub. No. (HSM) 73-1270. Health Services and Mental Health Administration. Washington. U.S. Government Printing Office, Jan. 1969.

# LIST OF DETAILED TABLES


Page

Table 1. Mean raw scores, with standard deviation and standard error of the mean, on specified subtests of the WISC and WRAT for youths 12-17 years, by selected demographic or socioeconomic characteristics: United States, 1966-70 . . 22

2. Mean T scores, with standard deviation and standard error of the mean, on the WISC Vocabulary and Block Design and combined subtests for youths 12-17 years, by selected demographic or socioeconomic characteristics: United States, 1966-70 . . . . . 23

3. Mean T scores, with standard deviation and standard error of the mean, on the WRAT Reading and Arithmetic and combined subtests for youths 12-17 years, by selected demographic or socioeconomic characteristics: United States, 1966-70 . . . . . 24

4. Average T-score equivalents of raw scores on combined subtests of the WISC and WRAT for youths 12-17 years, by family income, education of parent, and type of subtest, with standard errors for totals: United States, 1966-70 . . . 25

5. Average T-score equivalents of raw scores on combined subtests of the WISC and WRAT for youths 12-17 years, by number of persons under 21 in household, family income, and education of parent, with standard errors for totals: United States, 1966-70 . . . . . 26

6. Average T-score equivalents of raw scores on combined subtests of the WISC for youths 12-17 years, by size of place of residence, family income, and education of parent, with standard errors for totals: United States, 1966-70 . . . . 27

7. Average T-score equivalents of raw scores on combined subtests of the WRAT for youths 12-17 years, by size of place of residence, family income, and education of parent, with standard errors for totals: United States, 1966-70 . . . . 28

8. Average T-score equivalents of raw scores on specified subtests of the WISC and WRAT for youths 12-17 years, by rate of population change, family income, and education of parent, with standard errors for totals: United States, 1966-70 . . . . . 29

9. Average T-score equivalents of raw scores on specified subtests of the WISC and WRAT for youths 12-17 years, by grade level with respect to age, family income, and education of parent, with standard errors for totals: United States, 1966-70 . . . . . 30

10. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by grade level with respect to age and selected demographic or socioeconomic characteristics: United States, 1966-70 . . . . . 31

11. Average T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by grade level with respect to age and selected demographic or socioeconomic characteristics: United States, 1966-70 . . 32

12. Percent distribution of youths 12-17 years by type of early school attended and age started first grade, according to selected demographic or socioeconomic characteristics: United States, 1966-70 . . . . . 33

13. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by type of early school attended and selected demographic or socioeconomic characteristics: United States, 1966-70 . . . . . 34

14. Average T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by type of early school attended and selected demographic or socioeconomic characteristics: United States, 1966-70 . . 35

15. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by age they started first grade and selected demographic or socioeconomic characteristics: United States, 1966-70 . . 36

16. Average T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by age they started first grade and selected demographic or socioeconomic characteristics: United States, 1966-70 . . . 37

Page

Table 17. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design and combined subtests and the WRAT Arithmetic and Reading and combined subtests for youths 12-17 years, by race, family income, and education of parent, with standard errors for totals: United States, 1966-70[1] . . . . . 38

18. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design and combined subtests for youths 12-17 years, by geographic region, family income, and education, with standard errors for totals: United States, 1966-70 . . . . . 39

19. Average T-score equivalents of raw scores on the WRAT Arithmetic and Reading and combined subtests for youths 12-17 years, by geographic region, family income, and education of parent, with standard errors for totals: United States, 1966-70 . . . . . 40

Table 1. Mean raw scores, with standard deviation and standard error of the mean, on specified subtests of the WISC and WRAT for youths 12-17 years, by selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | WISC | | | | | | WRAT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Vocabulary | | | Block Design | | | Reading | | | Arithmetic | | |
| | Mean | SD | SE | Mean | SD | SE | Mean | SD | SE | Mean | SD | SE |
| All youths, 12-17 years | 41.2 | 11.24 | 0.59 | 28.9 | 13.88 | 0.36 | 48.5 | 13.61 | 0.42 | 23.0 | 6.95 | 0.26 |
| **Age** | | | | | | | | | | | | |
| 12 years | 36.5 | 9.44 | 0.50 | 24.0 | 12.87 | 0.41 | 42.1 | 11.51 | 0.37 | 19.2 | 5.07 | 0.23 |
| 13 years | 38.8 | 10.76 | 0.62 | 26.3 | 13.44 | 0.54 | 45.3 | 12.59 | 0.44 | 21.1 | 6.05 | 0.29 |
| 14 years | 40.9 | 10.87 | 0.81 | 29.3 | 13.65 | 0.56 | 48.2 | 12.83 | 0.58 | 23.0 | 6.52 | 0.35 |
| 15 years | 42.2 | 11.20 | 0.67 | 29.6 | 13.58 | 0.51 | 49.8 | 13.33 | 0.66 | 24.0 | 6.69 | 0.33 |
| 16 years | 44.4 | 11.27 | 0.57 | 31.8 | 14.01 | 0.56 | 52.8 | 13.18 | 0.41 | 25.6 | 7.15 | 0.31 |
| 17 years | 45.2 | 11.39 | 0.69 | 33.0 | 13.75 | 0.43 | 53.7 | 14.56 | 0.71 | 25.7 | 7.65 | 0.36 |
| **Sex** | | | | | | | | | | | | |
| Male | 42.2 | 11.26 | 0.64 | 30.4 | 13.73 | 0.38 | 47.2 | 13.92 | 0.50 | 23.0 | 7.13 | 0.27 |
| Female | 40.2 | 11.12 | 0.55 | 27.2 | 13.84 | 0.37 | 49.7 | 13.18 | 0.40 | 23.0 | 6.76 | 0.27 |
| **Race** | | | | | | | | | | | | |
| White | 42.5 | 10.87 | 0.67 | 30.5 | 13.49 | 0.39 | 50.2 | 13.02 | 0.50 | 23.9 | 6.75 | 0.30 |
| Black | 32.7 | 9.57 | 0.66 | 17.8 | 11.01 | 0.61 | 37.3 | 12.00 | 0.42 | 17.2 | 5.13 | 0.30 |
| Other | 39.8 | 13.59 | 2.44 | 35.0 | 13.71 | 2.72 | 49.0 | 15.02 | 1.84 | 27.0 | 7.95 | 1.26 |
| **Geographic region** | | | | | | | | | | | | |
| Northeast | 44.2 | 11.28 | 0.95 | 30.1 | 13.79 | 0.85 | 51.2 | 13.49 | 1.09 | 23.6 | 6.87 | 0.76 |
| Midwest | 42.4 | 10.00 | 1.29 | 31.5 | 13.20 | 0.68 | 50.8 | 12.56 | 0.99 | 24.0 | 6.74 | 0.68 |
| South | 37.4 | 11.54 | 1.14 | 23.9 | 14.15 | 1.22 | 43.3 | 14.05 | 1.11 | 21.1 | 7.14 | 0.53 |
| West | 40.8 | 11.20 | 1.50 | 29.4 | 13.29 | 0.97 | 48.3 | 13.05 | 0.86 | 23.1 | 6.69 | 0.40 |
| **Education of parent** | | | | | | | | | | | | |
| Elementary | 34.9 | 10.89 | 0.74 | 23.2 | 13.50 | 0.64 | 4.18 | 13.28 | 0.51 | 20.1 | 6.60 | 0.29 |
| 9th - 11th grade | 39.8 | 10.31 | 0.55 | 27.0 | 13.74 | 0.40 | 46.6 | 12.92 | 0.46 | 22.3 | 6.67 | 0.30 |
| 12th grade | 43.8 | 9.42 | 0.37 | 31.7 | 12.75 | 0.28 | 51.2 | 11.93 | 0.36 | 24.2 | 6.46 | 0.25 |
| Higher than 12th grade | 47.9 | 9.69 | 0.59 | 34.7 | 12.41 | 0.48 | 56.3 | 11.62 | 0.44 | 26.2 | 6.50 | 0.37 |
| Unknown | 35.4 | 11.22 | 1.21 | 23.8 | 14.42 | 1.72 | 43.1 | 13.84 | 1.33 | 20.2 | 6.94 | 0.65 |
| **Place of residence** | | | | | | | | | | | | |
| Urban | 41.8 | 11.23 | 0.49 | 29.2 | 13.70 | 0.34 | 49.2 | 13.80 | 0.35 | 23.1 | 6.93 | 0.18 |
| 3 million persons or more | 41.7 | 11.55 | 0.57 | 28.9 | 13.62 | 0.57 | 49.1 | 14.16 | 0.79 | 22.5 | 6.87 | 0.28 |
| 1 - 2.9 million persons | 43.5 | 10.36 | 1.36 | 30.6 | 12.76 | 1.30 | 51.2 | 13.17 | 1.05 | 23.9 | 6.29 | 0.33 |
| 250,000 - 999,999 persons | 41.8 | 10.86 | 0.79 | 29.5 | 14.22 | 1.60 | 49.5 | 13.81 | 0.99 | 23.2 | 7.22 | 0.31 |
| Less than 250,000 persons | 40.1 | 11.68 | 3.13 | 26.6 | 14.16 | 3.20 | 46.8 | 14.27 | 3.99 | 21.6 | 7.07 | 1.63 |
| Urban, other | | | | | | | | | | | | |
| 25,000 persons or more | 40.8 | 12.66 | 4.19 | 29.9 | 13.43 | 2.31 | 50.1 | 14.00 | 3.31 | 23.7 | 7.11 | 1.86 |
| 10,000 - 24,999 persons | 41.1 | 10.59 | 2.68 | 28.7 | 14.06 | 2.32 | 47.3 | 12.46 | 2.84 | 24.3 | 7.08 | 1.40 |
| 2,500 - 9,999 persons | 41.0 | 11.32 | 0.68 | 29.3 | 13.91 | 0.64 | 47.8 | 13.44 | 0.69 | 23.6 | 7.06 | 0.45 |
| Rural | 40.2 | 11.12 | 0.94 | 28.2 | 14.17 | 0.69 | 47.1 | 13.18 | 0.84 | 22.9 | 6.98 | 0.54 |
| **Rate of population change** | | | | | | | | | | | | |
| Loss | 39.8 | 11.32 | 1.10 | 26.9 | 14.16 | 1.02 | 46.1 | 13.14 | 1.18 | 22.7 | 7.04 | 0.56 |
| Below average gain | 40.6 | 11.11 | 1.64 | 29.3 | 13.50 | 0.95 | 48.5 | 13.17 | 1.26 | 22.7 | 6.42 | 0.43 |
| Average gain | 39.6 | 10.90 | 0.75 | 27.1 | 13.72 | 1.09 | 47.5 | 14.15 | 0.93 | 22.1 | 6.90 | 0.39 |
| Above average gain | 44.5 | 10.90 | 0.83 | 31.8 | 13.55 | 0.80 | 51.4 | 13.44 | 0.86 | 24.4 | 7.16 | 0.70 |
| **Annual family income** | | | | | | | | | | | | |
| Less than $3,000 | 32.4 | 10.72 | 0.88 | 19.8 | 12.58 | 0.86 | 38.6 | 12.72 | 0.74 | 18.4 | 6.02 | 0.43 |
| $3,000 - $4,999 | 35.9 | 10.69 | 0.68 | 23.4 | 13.29 | 0.42 | 42.2 | 12.84 | 0.60 | 20.2 | 6.63 | 0.40 |
| $5,000 - $6,999 | 40.0 | 10.64 | 0.54 | 27.9 | 13.69 | 0.58 | 46.8 | 12.88 | 0.60 | 22.4 | 6.50 | 0.34 |
| $7,000 - $9,999 | 43.0 | 9.51 | 0.61 | 31.3 | 13.11 | 0.49 | 50.5 | 12.01 | 0.53 | 23.8 | 6.36 | 0.36 |
| $10,000 - $14,999 | 45.5 | 9.42 | 0.53 | 32.7 | 12.74 | 0.28 | 53.8 | 11.83 | 0.37 | 25.4 | 6.46 | 0.28 |
| $15,000 or more | 48.4 | 9.55 | 0.75 | 35.6 | 12.31 | 0.84 | 56.7 | 11.76 | 0.77 | 26.9 | 6.42 | 0.44 |
| Unknown | 40.1 | 11.78 | 0.87 | 27.9 | 13.35 | 0.96 | 47.0 | 13.98 | 1.07 | 22.4 | 7.25 | 0.51 |
| **Grade level for age** | | | | | | | | | | | | |
| Above modal grade | 46.5 | 10.05 | 0.85 | 33.4 | 12.78 | 0.75 | 55.7 | 11.98 | 0.94 | 26.1 | 6.70 | 0.38 |
| In modal grade | 43.6 | 9.87 | 0.38 | 30.8 | 13.32 | 0.29 | 51.7 | 11.83 | 0.36 | 24.3 | 6.45 | 0.24 |
| Below modal grade | 36.7 | 11.29 | 1.21 | 25.1 | 13.85 | 0.90 | 42.1 | 13.33 | 1.10 | 20.5 | 6.83 | 0.48 |
| Grade level undetermined | 29.0 | 11.9 | 0.70 | 19.3 | 13.59 | 0.83 | 34.8 | 14.05 | 0.96 | 16.0 | 6.33 | 0.35 |

Table 2. Mean T scores, with standard deviation and standard error of the mean, on the WISC Vocabulary and Block Design and combined subtests for youths 12-17 years, by selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | Vocabulary | | | Block Design | | | Composite | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | SE | Mean | SD | SE | Mean | SD | SE |
| All youths, 12-17 years | 50.0 | 10.00 | 0.54 | 50.0 | 10.00 | 0.27 | 100.0 | 15.00 | 0.67 |
| **Race** | | | | | | | | | |
| White | 51.2 | 9.69 | 0.82 | 51.2 | 9.66 | 0.29 | 102.0 | 14.34 | 0.76 |
| Black | 42.3 | 8.14 | 0.55 | 42.0 | 8.05 | 0.47 | 86.5 | 11.73 | 0.81 |
| Other | 48.9 | 12.78 | 2.36 | 55.2 | 10.50 | 2.31 | 103.4 | 18.66 | 3.78 |
| **Geographic region** | | | | | | | | | |
| Northeast | 52.9 | 10.16 | 0.88 | 51.0 | 10.00 | 0.62 | 103.4 | 14.39 | 1.23 |
| Midwest | 51.0 | 8.73 | 1.72 | 51.9 | 9.35 | 0.51 | 102.5 | 13.30 | 1.47 |
| South | 46.4 | 10.13 | 0.94 | 46.3 | 10.23 | 0.86 | 93.7 | 15.69 | 1.55 |
| West | 49.7 | 10.01 | 1.37 | 50.3 | 9.46 | 0.70 | 100.0 | 14.40 | 1.71 |
| **Annual family income** | | | | | | | | | |
| Less than $3,000 | 42.0 | 8.96 | 0.74 | 43.3 | 9.02 | 0.67 | 87.4 | 13.14 | 0.96 |
| $3,000 - $4,999 | 45.4 | 9.42 | 0.63 | 46.2 | 9.43 | 0.28 | 92.8 | 14.00 | 0.71 |
| $5,000 - $6,999 | 48.9 | 9.50 | 0.57 | 49.2 | 9.74 | 0.44 | 98.4 | 14.35 | 0.71 |
| $7,000 - $9,999 | 51.7 | 8.48 | 0.57 | 51.8 | 9.45 | 0.38 | 103.0 | 12.94 | 0.76 |
| $10,000 - $14,999 | 54.0 | 8.56 | 0.50 | 52.9 | 9.26 | 0.22 | 105.9 | 12.75 | 0.52 |
| $15,000 or more | 56.5 | 8.67 | 0.73 | 54.8 | 8.95 | 0.64 | 109.7 | 12.94 | 1.13 |
| Unknown | 48.7 | 10.30 | 0.79 | 48.8 | 9.25 | 0.73 | 97.9 | 14.72 | 1.23 |
| **Grade level for age** | | | | | | | | | |
| Above modal grade | 54.6 | 8.99 | 0.73 | 53.1 | 9.12 | 0.48 | 106.7 | 13.20 | 0.93 |
| In modal grade | 52.4 | 8.77 | 0.35 | 51.6 | 9.52 | 0.20 | 103.5 | 13.33 | 0.43 |
| Below modal grade | 45.8 | 9.83 | 1.11 | 47.1 | 9.85 | 0.65 | 93.9 | 14.82 | 1.47 |
| Grade level undetermined | 37.7 | 8.29 | 0.54 | 41.6 | 9.61 | 0.65 | 82.1 | 13.61 | 0.89 |
| **Education of parent** | | | | | | | | | |
| Elementary | 44.3 | 9.30 | 0.66 | 45.8 | 9.58 | 0.49 | 91.5 | 14.05 | 0.88 |
| 9th - 11th grade | 48.5 | 8.92 | 0.50 | 48.5 | 9.73 | 0.28 | 97.5 | 13.77 | 0.57 |
| 12th grade | 52.4 | 8.42 | 0.39 | 52.1 | 9.15 | 0.18 | 103.8 | 12.48 | 0.39 |
| Higher than 12th grade | 56.4 | 8.80 | 0.54 | 54.4 | 9.03 | 0.36 | 109.3 | 13.06 | 0.73 |
| Unknown | 44.3 | 9.66 | 1.13 | 45.8 | 10.29 | 1.26 | 91.6 | 15.34 | 1.92 |
| **Place of residence** | | | | | | | | | |
| Urban | 50.5 | 10.00 | 0.46 | 50.2 | 9.83 | 0.25 | 100.7 | 14.87 | 0.56 |
| 3 million persons or more | 50.6 | 10.28 | 0.51 | 50.1 | 9.74 | 0.42 | 100.6 | 14.93 | 0.74 |
| 1 - 2.9 million persons | 52.1 | 9.31 | 1.30 | 51.3 | 9.03 | 0.87 | 103.0 | 13.65 | 1.84 |
| 250,000 - 999,999 persons | 50.4 | 9.72 | 0.64 | 50.3 | 10.41 | 1.30 | 100.6 | 15.29 | 1.44 |
| Less than 250,000 persons | 49.0 | 10.35 | 2.84 | 48.4 | 9.96 | 2.32 | 97.7 | 15.22 | 4.27 |
| Urban, other | | | | | | | | | |
| 25,000 persons or more | 49.5 | 10.82 | 3.65 | 50.6 | 9.44 | 1.59 | 100.0 | 14.84 | 4.48 |
| 10,000 - 24,999 persons | 49.9 | 9.18 | 2.55 | 49.5 | 10.02 | 1.63 | 99.5 | 14.68 | 3.51 |
| 2,500 - 9,999 persons | 50.0 | 10.01 | 0.65 | 50.3 | 10.27 | 0.47 | 100.3 | 15.31 | 0.90 |
| Rural | 49.1 | 9.91 | 0.87 | 49.5 | 10.20 | 0.51 | 98.8 | 15.18 | 1.14 |
| **Rate of population change** | | | | | | | | | |
| Loss | 48.8 | 10.11 | 1.02 | 48.5 | 10.28 | 0.75 | 97.8 | 15.46 | 1.44 |
| Below average gain | 49.3 | 9.86 | 1.50 | 50.2 | 9.55 | 0.67 | 99.6 | 14.25 | 1.65 |
| Average gain | 48.6 | 9.54 | 0.66 | 48.8 | 9.75 | 0.78 | 97.8 | 14.57 | 1.16 |
| Above average gain | 52.9 | 9.79 | 0.78 | 52.1 | 9.89 | 0.62 | 104.3 | 14.74 | 1.18 |

Table 3. Mean T scores, with standard deviation and standard error of the mean, on the WRAT Reading and Arithmetic and combined subtests for youths 12-17 years, by selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | Reading | | | Arithmetic | | | Composite | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | SE | Mean | SD | SE | Mean | SD | SE |
| All youths, 12-17 years | 50.0 | 10.00 | 0.32 | 50.0 | 10.00 | 0.40 | 100.0 | 15.00 | 0.57 |
| **Race** | | | | | | | | | |
| White | 51.3 | 9.55 | 0.38 | 51.3 | 9.52 | 0.45 | 102.1 | 14.18 | 0.65 |
| Black | 41.6 | 8.80 | 0.31 | 41.1 | 7.67 | 0.48 | 85.8 | 12.14 | 0.62 |
| Other | 50.5 | 11.51 | 1.15 | 56.2 | 12.04 | 1.83 | 105.4 | 17.66 | 2.28 |
| **Geographic region** | | | | | | | | | |
| Northeast | 52.3 | 10.00 | 0.79 | 51.1 | 9.82 | 1.11 | 102.8 | 14.83 | 1.52 |
| Midwest | 51.8 | 9.12 | 0.76 | 51.5 | 9.36 | 1.02 | 102.7 | 13.59 | 1.42 |
| South | 46.0 | 10.39 | 0.80 | 46.8 | 10.36 | 0.77 | 94.1 | 15.79 | 1.27 |
| West | 49.9 | 9.53 | 0.64 | 50.2 | 9.66 | 0.64 | 100.0 | 14.35 | 0.99 |
| **Annual family income** | | | | | | | | | |
| Less than $3,000 | 42.3 | 9.17 | 0.55 | 42.8 | 8.83 | 0.65 | 87.9 | 13.41 | 0.95 |
| $3,000 - $4,999 | 45.4 | 9.44 | 0.46 | 45.8 | 9.57 | 0.62 | 92.7 | 14.24 | 0.85 |
| $5,000 - $6,999 | 48.7 | 9.47 | 0.49 | 49.1 | 9.49 | 0.59 | 98.2 | 14.15 | 0.83 |
| $7,000 - $9,999 | 51.8 | 8.73 | 0.43 | 51.4 | 8.97 | 0.58 | 102.5 | 12.96 | 0.80 |
| $10,000 - $14,999 | 54.1 | 8.72 | 0.29 | 53.7 | 8.92 | 0.40 | 106.3 | 12.78 | 0.51 |
| $15,000 or more | 56.2 | 8.81 | 0.62 | 55.6 | 8.75 | 0.65 | 109.7 | 12.60 | 0.98 |
| Unknown | 48.5 | 9.84 | 0.87 | 48.6 | 9.96 | 0.73 | 97.7 | 14.88 | 1.17 |
| **Grade level for age** | | | | | | | | | |
| Above modal grade | 55.6 | 9.06 | 0.67 | 54.8 | 9.22 | 0.46 | 108.5 | 13.30 | 0.85 |
| In modal grade | 52.6 | 8.62 | 0.27 | 52.2 | 8.94 | 0.36 | 103.9 | 12.73 | 0.47 |
| Below modal grade | 45.2 | 9.57 | 0.81 | 46.0 | 9.55 | 0.91 | 92.8 | 14.41 | 1.40 |
| Grade level undetermined | 38.2 | 8.96 | 0.59 | 37.7 | 8.24 | 0.44 | 80.5 | 13.33 | 0.81 |
| **Education of parent** | | | | | | | | | |
| Elementary | 44.8 | 9.59 | 0.38 | 45.4 | 9.40 | 0.44 | 92.0 | 14.28 | 0.65 |
| 9th - 11th grade | 48.4 | 9.30 | 0.36 | 48.8 | 9.41 | 0.47 | 97.6 | 13.89 | 0.64 |
| 12th grade | 52.1 | 8.69 | 0.30 | 51.9 | 9.10 | 0.42 | 103.2 | 13.01 | 0.56 |
| Higher than 12th grade | 56.1 | 8.66 | 0.32 | 55.1 | 8.98 | 0.54 | 109.2 | 12.69 | 0.65 |
| Unknown | 45.1 | 9.69 | 0.88 | 45.2 | 10.30 | 0.98 | 92.1 | 15.27 | 1.42 |
| **Place of residence** | | | | | | | | | |
| Urban | 50.6 | 10.17 | 0.27 | 50.1 | 9.92 | 0.28 | 100.6 | 15.13 | 0.43 |
| 3 million persons or more | 50.6 | 10.46 | 0.60 | 49.3 | 9.92 | 0.43 | 99.9 | 15.41 | 0.82 |
| 1 - 2.9 million persons | 52.2 | 9.81 | 0.88 | 51.5 | 9.04 | 0.47 | 103.1 | 13.94 | 1.07 |
| 250,000 - 999,999 persons | 50.7 | 10.38 | 0.78 | 50.1 | 10.43 | 0.51 | 100.6 | 15.74 | 1.04 |
| Less than 250,000 persons | 48.7 | 10.25 | 2.85 | 47.6 | 9.92 | 2.46 | 97.0 | 15.42 | 4.27 |
| Urban, other | | | | | | | | | |
| 25,000 persons or more | 51.1 | 9.67 | 2.09 | 50.7 | 9.17 | 2.32 | 101.5 | 14.18 | 3.58 |
| 10,000 - 24,999 persons | 49.1 | 9.19 | 2.21 | 52.0 | 10.19 | 2.01 | 100.8 | 14.45 | 2.94 |
| 2,500 - 9,999 persons | 49.5 | 9.74 | 0.48 | 51.1 | 10.28 | 0.70 | 100.4 | 15.25 | 0.90 |
| Rural | 49.0 | 9.70 | 0.64 | 49.7 | 9.99 | 0.80 | 99.0 | 14.73 | 1.15 |
| **Rate of population change** | | | | | | | | | |
| Loss | 48.2 | 9.78 | 0.92 | 49.5 | 10.04 | 0.84 | 98.1 | 14.87 | 1.35 |
| Below average gain | 50.0 | 9.62 | 0.93 | 49.5 | 9.13 | 0.68 | 99.6 | 14.03 | 1.20 |
| Average gain | 49.4 | 10.40 | 0.70 | 48.7 | 10.09 | 0.63 | 98.5 | 15.53 | 1.07 |
| Above average gain | 52.2 | 9.86 | 0.66 | 52.0 | 10.16 | 1.06 | 103.4 | 14.93 | 1.35 |

Table 4. Average T-score equivalents of raw scores on combined subtests of the WISC and WRAT for youths 12-17 years, by family income, education of parent, and type of subtest, with standard errors for totals: United States, 1966-70

| Type of test and education of parent | Total | Annual family income | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Less than $3,000 | $3,000-4,999 | $5,000-6,999 | $7,000-9,999 | $10,000-14,999 | $15,000 or more | Unknown |
| | Average T score | | | | | | | |
| **WISC** | | | | | | | | |
| All youths, 12-17 years | 100.0 | 87.4 | 92.8 | 98.4 | 103.0 | 105.9 | 109.7 | 97.9 |
| Education of parent | | | | | | | | |
| None | 81.1 | 78.5 | 83.4 | • | • | ... | ... | • |
| Less than 5 years | 83.5 | 81.0 | 85.4 | 86.6 | 92.6 | • | • | 79.3 |
| 5-7 years | 90.2 | 86.2 | 87.1 | 96.0 | 93.5 | 97.4 | • | 90.1 |
| 8 years | 96.7 | 91.1 | 94.2 | 96.4 | 99.6 | 101.3 | 103.5 | 96.7 |
| 9-11 years | 97.5 | 88.5 | 93.9 | 95.8 | 101.0 | 102.9 | 103.3 | 97.5 |
| 12 years | 103.8 | 96.5 | 99.9 | 103.2 | 104.4 | 105.8 | 106.9 | 103.7 |
| 13-15 years | 106.6 | 95.6 | 100.7 | 103.6 | 106.3 | 108.9 | 107.0 | 103.3 |
| 16 years | 110.5 | • | • | 100.9 | 111.9 | 108.8 | 114.4 | 107.6 |
| 17 years or more | 111.9 | ... | • | 110.8 | 110.6 | 110.3 | 113.8 | 107.8 |
| Unknown | 91.6 | 83.5 | 90.8 | 90.1 | 99.5 | 105.1 | • | 83.9 |
| **WRAT** | | | | | | | | |
| All youths, 12-17 years | 100.0 | 87.9 | 92.7 | 98.2 | 102.5 | 106.3 | 109.7 | 97.7 |
| Education of parent | | | | | | | | |
| None | 84.5 | 81.5 | 84.8 | • | • | ... | ... | • |
| Less than 5 years | 85.1 | 82.2 | 87.1 | 88.4 | 92.5 | • | • | 82.5 |
| 5-7 years | 90.7 | 87.5 | 87.8 | 94.4 | 94.4 | 99.4 | • | 89.2 |
| 8 years | 96.5 | 89.7 | 94.5 | 96.0 | 99.2 | 101.4 | 103.3 | 98.6 |
| 9-11 years | 97.6 | 88.2 | 92.5 | 96.2 | 101.1 | 105.1 | 103.8 | 96.1 |
| 12 years | 103.2 | 95.9 | 99.4 | 102.8 | 103.7 | 105.2 | 106.8 | 102.2 |
| 13-15 years | 105.8 | 96.1 | 102.8 | 100.3 | 105.0 | 108.1 | 107.2 | 103.0 |
| 16 years | 111.7 | • | • | 104.7 | 112.0 | 110.8 | 115.3 | 108.1 |
| 17 years or more | 111.3 | ... | • | 110.9 | 107.8 | 111.3 | 112.7 | 110.7 |
| Unknown | 92.1 | 86.0 | 90.2 | 90.1 | 99.2 | 105.8 | • | 84.0 |
| | Standard error of T score[1] | | | | | | | |
| WISC, all youths 12-17 years | 0.67 | 0.96 | 0.71 | 0.77 | 0.76 | 0.52 | 1.13 | 1.23 |
| WRAT, all youths 12-17 years | 0.57 | 0.95 | 0.85 | 0.83 | 0.80 | 0.51 | 0.98 | 1.17 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table V.

Table 5. Average T-score equivalents of raw scores on combined subtests of the WISC and WRAT for youths 12-17 years, by number of persons under 21 in household, family income, and education of parent, with standard errors for totals: United States, 1966-70

| Annual family income and education of parent | WISC Composite | | | | | WRAT Composite | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | One | Two | Three | Four | Five or more | One | Two | Three | Four | Five or more |
| | Average T score | | | | | | | | | |
| All youths, 12-17 years | 102.1 | 102.6 | 102.4 | 100.3 | 94.8 | 101.9 | 102.7 | 102.0 | 100.2 | 95.2 |
| Income less than $5,000 | | | | | | | | | | |
| Education of parent: | | | | | | | | | | |
| Elementary school | 90.8 | 90.5 | 90.3 | 86.2 | 83.9 | 92.3 | 90.4 | 90.0 | 87.6 | 85.1 |
| 9th - 11th grade | 99.7 | 93.5 | 90.5 | 90.8 | 89.6 | 96.1 | 93.8 | 90.7 | 89.0 | 88.9 |
| 12th grade | 106.0 | 99.3 | 100.0 | 97.2 | 93.8 | 104.1 | 100.5 | 98.7 | 97.4 | 92.7 |
| Higher than 12th grade | 110.0 | 96.9 | * | 100.4 | * | 103.3 | 103.7 | * | 95.8 | * |
| Income of $5,000-$9,999 | | | | | | | | | | |
| Education of parent: | | | | | | | | | | |
| Elementary school | 97.3 | 97.7 | 97.4 | 97.1 | 93.1 | 98.8 | 97.9 | 96.0 | 96.2 | 93.5 |
| 9th - 11th grade | 103.6 | 102.2 | 98.4 | 99.8 | 93.4 | 103.2 | 102.5 | 97.8 | 100.4 | 93.7 |
| 12th grade | 105.6 | 104.4 | 104.3 | 102.0 | 103.3 | 105.2 | 104.6 | 103.1 | 100.5 | 102.8 |
| Higher than 12th grade | 108.4 | 109.1 | 107.3 | 106.6 | 105.8 | 106.1 | 108.0 | 106.3 | 107.3 | 105.5 |
| Income of $10,000 and over | | | | | | | | | | |
| Education of parent: | | | | | | | | | | |
| Elementary school | 101.6 | 100.5 | 103.7 | 97.8 | 97.9 | 103.2 | 101.4 | 104.9 | 96.6 | 99.3 |
| 9th - 11th grade | 102.8 | 106.6 | 101.5 | 103.8 | 100.7 | 102.6 | 107.6 | 104.2 | 105.2 | 103.9 |
| 12th grade | 107.1 | 106.8 | 107.4 | 103.7 | 105.3 | 106.2 | 107.2 | 106.3 | 103.9 | 104.5 |
| Higher than 12th grade | 110.8 | 110.2 | 111.4 | 111.6 | 108.3 | 110.3 | 109.6 | 112.3 | 111.3 | 109.9 |
| | Standard error of T score[1] | | | | | | | | | |
| All youths, 12-17 years | 0.79 | 0.58 | 0.72 | 0.83 | 1.07 | 0.63 | 0.62 | 0.83 | 0.59 | 0.79 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table VI.

Table 6. Average T-score equivalents of raw scores on combined subtests of the WISC for youths 12-17 years, by size of place of residence, family income, and education of parent, with standard errors for totals: United States, 1966-70

| Annual family income and education of parent | Urbanized areas | | | | Urban places outside urbanized areas | | | Rural areas |
|---|---|---|---|---|---|---|---|---|
| | 3 million persons or more | 1,000,000-2,999,999 persons | 250,000-999,999 persons | Less than 250,000 persons | 25,000 persons or more | 10,000-24,999 persons | 2,500-9,999 persons | |
| | Average T score | | | | | | | |
| All youths, 12-17 years | 100.6 | 103.0 | 100.6 | 97.7 | 100.0 | 99.5 | 100.3 | 98.8 |
| Income less than $5,000 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 88.9 | 86.3 | 88.0 | 86.6 | 87.1 | * | 87.8 | 86.7 |
| 9th - 11th grade | 89.8 | 96.9 | 91.1 | 89.9 | * | * | 92.1 | 90.5 |
| 12th grade | 98.9 | * | 92.7 | 98.5 | 95.7 | ... | 101.5 | 100.9 |
| Higher than 12th grade | * | * | * | 108.7 | 98.0 | ... | 95.5 | 107.5 |
| Income of $5,000-$9,999 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 94.2 | 95.6 | 95.5 | 93.5 | 91.8 | 96.6 | 99.2 | 97.0 |
| 9th - 11th grade | 97.8 | 97.9 | 100.5 | 96.9 | 95.1 | 98.7 | 99.3 | 99.9 |
| 12th grade | 103.0 | 104.2 | 101.3 | 106.9 | 102.6 | 104.7 | 106.3 | 104.5 |
| Higher than 12th grade | 105.4 | 107.5 | 103.6 | 111.1 | 108.3 | 114.1 | 109.6 | 108.0 |
| Income of $10,000 or more | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 100.7 | * | 97.5 | 106.6 | 95.9 | * | 96.0 | 100.6 |
| 9th - 11th grade | 105.1 | 101.6 | 103.4 | 97.9 | 104.9 | * | 107.5 | 102.5 |
| 12th grade | 106.1 | 105.8 | 106.6 | * | 109.4 | * | 110.1 | 104.6 |
| Higher than 12th grade | 110.7 | 110.8 | 112.0 | 109.1 | 111.5 | * | 109.1 | 110.3 |
| | Standard error of T score[1] | | | | | | | |
| All youths, 12-17 years | 0.74 | 1.84 | 1.44 | 4.27 | 4.48 | 3.51 | 0.90 | 1.14 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table VII.

Table 7. Average T-score equivalents of raw scores on combined subtests of the WRAT for youths 12-17 years, by size of place of residence, family income, and education of parent, with standard errors for totals: United States, 1966-70

| Annual family income and education of parent | Urbanized areas | | | | Urbanized places outside urbanized areas | | | Rural areas |
|---|---|---|---|---|---|---|---|---|
| | 3 million persons or more | 1,000,000-2,999,999 persons | 250,000-999,999 persons | Less than 250,000 persons | 25,000 persons or more | 10,000-24,999 persons | 2,500-9,999 persons | |
| | Average T score | | | | | | | |
| All youths, 12-17 years | 99.9 | 103.1 | 100.6 | 97.0 | 101.5 | 100.8 | 100.4 | 99.0 |
| Income less than $5,000 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 88.7 | 88.6 | 87.5 | 86.2 | 89.3 | * | 88.5 | 88.0 |
| 9th - 11th grade | 86.2 | 94.4 | 91.5 | 89.2 | * | * | 90.1 | 91.7 |
| 12th grade | 96.8 | * | 90.5 | 99.6 | 96.6 | ... | 103.4 | 100.5 |
| Higher than 12th grade | * | * | * | 101.9 | 94.1 | ... | 107.2 | 106.7 |
| Income of $5,000-$9,999 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 94.5 | 94.6 | 93.6 | 92.6 | 90.6 | 98.1 | 99.5 | 97.4 |
| 9th - 11th grade | 97.0 | 99.4 | 99.9 | 95.6 | 96.6 | 104.0 | 99.6 | 99.2 |
| 12th grade | 101.6 | 102.9 | 102.4 | 104.7 | 106.0 | 104.5 | 103.7 | 103.7 |
| Higher than 12th grade | 107.6 | 104.7 | 103.1 | 108.7 | 105.9 | 111.4 | 109.3 | 107.4 |
| Income of $10,000 or more | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 97.1 | * | 98.6 | 107.7 | 101.2 | * | 102.4 | 100.7 |
| 9th - 11th grade | 108.0 | 102.7 | 107.5 | 97.9 | 104.7 | * | 103.8 | 104.6 |
| 12th grade | 104.7 | 106.4 | 105.8 | * | 106.5 | * | 111.2 | 104.6 |
| Higher than 12th grade | 110.5 | 111.6 | 113.2 | 111.2 | 114.3 | * | 110.0 | 109.1 |
| | Standard error of T score[1] | | | | | | | |
| All youths, 12-17 years | 0.82 | 1.07 | 1.04 | 4.27 | 3.58 | 2.94 | 0.90 | 1.15 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table VIII.

Table 8. Average T-score equivalents of raw scores on combined subtests of the WISC and WRAT for youths 12-17 years, by rate of population change, family income, and education of parent, with standard errors for totals: United States, 1966-70

| Annual family income and education of parent | WISC Composite | | | | WRAT Composite | | | |
|---|---|---|---|---|---|---|---|---|
| | Loss | Below average gain | Average gain | Above average gain | Loss | Below average gain | Average gain | Above average gain |
| | Average T score | | | | | | | |
| All youths, 12-17 years | 97.8 | 99.6 | 97.8 | 104.3 | 98.1 | 99.6 | 98.5 | 103.4 |
| Income less than $5,000 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 87.8 | 87.1 | 83.5 | 92.0 | 89.2 | 88.5 | 84.2 | 89.8 |
| 9th - 11th grade | 95.2 | 93.1 | 88.5 | 90.2 | 94.6 | 91.2 | 88.5 | 89.0 |
| 12th grade | 100.3 | 97.5 | 95.8 | 99.0 | 102.5 | 96.8 | 93.7 | 96.2 |
| Higher than 12th grade | 104.8 | * | 102.1 | 97.9 | 104.3 | * | 100.5 | 100.4 |
| Income of $5,000-$9,999 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 96.1 | 93.8 | 95.7 | 98.8 | 96.6 | 95.3 | 94.7 | 96.9 |
| 9th - 11th grade | 98.6 | 98.0 | 96.9 | 101.9 | 99.0 | 98.0 | 97.9 | 100.6 |
| 12th grade | 106.1 | 103.3 | 101.4 | 104.6 | 104.6 | 102.0 | 102.5 | 103.7 |
| Higher than 12th grade | 108.6 | 107.1 | 103.0 | 110.5 | 106.9 | 107.6 | 103.3 | 106.8 |
| Income of $10,000 or more | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 101.4 | 101.3 | 99.5 | 98.5 | 103.4 | 99.5 | 100.5 | 100.3 |
| 9th - 11th grade | 102.6 | 102.5 | 101.6 | 104.9 | 102.9 | 103.1 | 105.4 | 107.1 |
| 12th grade | 107.2 | 106.0 | 104.5 | 106.7 | 106.5 | 105.8 | 104.3 | 106.1 |
| Higher than 12th grade | 111.4 | 110.3 | 108.5 | 111.6 | 110.9 | 109.9 | 110.9 | 111.2 |
| | Standard error of T score[1] | | | | | | | |
| All youths, 12-17 years | 1.44 | 1.65 | 1.16 | 1.18 | 1.35 | 1.20 | 1.07 | 1.35 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table IX.

Table 9. Average T-score equivalents of raw scores on specified subtests of the WISC and WRAT for youths 12-17 years, by grade level with respect to age, family income, and education of parent, with standard errors for totals: United States, 1966-70

| Annual family income and education of parent | WISC Vocabulary | | | WISC Block Design | | | WRAT Reading | | | WRAT Arithmetic | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Below modal grade | In modal grade | Above modal grade | Below modal grade | In modal grade | Above modal grade | Below modal grade | In modal grade | Above modal grade | Below modal grade | In modal grade | Above modal grade |
| | Average T score | | | | | | | | | | | |
| All youths, 12-17 years | 45.8 | 52.4 | 54.6 | 47.1 | 51.6 | 53.1 | 45.2 | 52.6 | 55.6 | 46.0 | 52.2 | 54.8 |
| Income less than $5,000 | | | | | | | | | | | | |
| Education of parent | | | | | | | | | | | | |
| Elementary school | 38.9 | 46.0 | 46.7 | 42.0 | 45.8 | 47.3 | 39.4 | 46.7 | 48.1 | 40.5 | 47.1 | 48.8 |
| 9th - 11th grade | 42.5 | 47.0 | 48.6 | 43.4 | 47.2 | 51.5 | 41.1 | 46.9 | 49.6 | 43.1 | 46.6 | 49.1 |
| 12th grade | 46.9 | 50.7 | 54.1 | 46.2 | 49.2 | 51.9 | 44.9 | 50.3 | 54.1 | 45.0 | 49.6 | 55.5 |
| Higher than 12th grade | 49.4 | 54.2 | * | 49.9 | 50.3 | * | 47.9 | 54.0 | * | 42.5 | 53.5 | * |
| Income of $5,000-$9,999 | | | | | | | | | | | | |
| Education of parent | | | | | | | | | | | | |
| Elementary school | 43.8 | 50.0 | 51.6 | 45.2 | 50.8 | 51.2 | 43.4 | 50.5 | 52.2 | 43.8 | 50.8 | 52.9 |
| 9th - 11th grade | 46.2 | 50.9 | 53.0 | 48.2 | 50.0 | 51.5 | 46.3 | 50.9 | 53.7 | 47.6 | 50.3 | 51.4 |
| 12th grade | 49.3 | 53.4 | 55.5 | 50.1 | 53.0 | 54.7 | 47.8 | 53.6 | 56.5 | 48.4 | 53.1 | 56.0 |
| Higher than 12th grade | 52.5 | 55.5 | 57.9 | 51.5 | 54.3 | 56.6 | 50.8 | 55.2 | 59.3 | 51.4 | 54.3 | 57.2 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Education of parent | | | | | | | | | | | | |
| Elementary school | 48.1 | 49.6 | 49.7 | 49.0 | 51.5 | 51.5 | 45.8 | 51.9 | 51.7 | 46.9 | 51.4 | 53.9 |
| 9th - 11th grade | 48.8 | 53.5 | 54.2 | 48.6 | 52.0 | 52.5 | 47.6 | 54.3 | 54.3 | 50.3 | 54.1 | 56.1 |
| 12th grade | 51.3 | 54.3 | 56.4 | 51.8 | 53.8 | 53.1 | 49.4 | 54.2 | 57.9 | 50.2 | 54.0 | 56.0 |
| Higher than 12th grade | 54.6 | 57.7 | 60.2 | 53.8 | 55.1 | 56.6 | 53.7 | 57.5 | 61.0 | 53.5 | 56.4 | 58.3 |
| | Standard error of T score[1] | | | | | | | | | | | |
| All youths, 12-17 years | 1.11 | 0.35 | 0.73 | 0.65 | 0.20 | 0.48 | 0.81 | 0.27 | 0.67 | 0.91 | 0.36 | 0.46 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table X.

Table 10. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by grade level with respect to age and selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | WISC Vocabulary | | | | WISC Block Design | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | Below modal grade | In modal grade | Above modal grade | Total | Below modal grade | In modal grade | Above modal grade |
| | Average T score[1] | | | | | | | |
| All youths, 12-17 years | 50.0 | 45.8 | 52.4 | 54.6 | 50.0 | 47.1 | 51.6 | 53.1 |
| **Place of residence** | | | | | | | | |
| Urbanized areas | 50.7 | 45.2 | 52.8 | 55.7 | 50.2 | 46.4 | 51.7 | 53.6 |
| Urban, other | 49.8 | 47.1 | 52.5 | 52.8 | 50.2 | 48.6 | 51.9 | 51.8 |
| Rural areas | 49.1 | 46.0 | 51.7 | 52.9 | 49.5 | 47.2 | 51.4 | 52.6 |
| **Rate of population change** | | | | | | | | |
| Loss | 48.8 | 43.0 | 51.9 | 53.4 | 48.5 | 43.8 | 51.1 | 51.9 |
| Below average gain | 49.3 | 46.1 | 52.1 | 55.1 | 50.2 | 48.7 | 51.4 | 53.9 |
| Average gain | 48.6 | 43.8 | 51.0 | 53.9 | 48.8 | 45.2 | 50.7 | 52.6 |
| Above average gain | 52.9 | 50.0 | 54.2 | 56.3 | 52.1 | 49.9 | 53.0 | 54.6 |
| **Race** | | | | | | | | |
| White | 51.2 | 47.2 | 53.3 | 55.3 | 51.2 | 48.5 | 52.6 | 53.8 |
| Black | 42.3 | 39.4 | 45.2 | 46.8 | 42.0 | 40.0 | 43.8 | 46.2 |
| **Geographic region** | | | | | | | | |
| Northeast | 52.9 | 47.8 | 54.2 | 56.3 | 51.0 | 47.2 | 51.7 | 54.0 |
| Midwest | 51.0 | 47.9 | 51.9 | 55.2 | 51.9 | 50.1 | 52.6 | 54.0 |
| South | 46.4 | 43.3 | 50.2 | 48.2 | 46.3 | 43.8 | 49.1 | 48.3 |
| West | 49.7 | 45.9 | 53.2 | 52.6 | 50.3 | 48.0 | 52.5 | 51.9 |
| **Annual family income** | | | | | | | | |
| Less than $5,000 | 43.8 | 40.5 | 47.6 | 48.9 | 44.9 | 42.7 | 47.1 | 49.0 |
| $5,000-$9,999 | 50.5 | 47.1 | 52.3 | 54.3 | 50.7 | 48.1 | 52.0 | 53.7 |
| $10,000 or more | 54.9 | 52.0 | 55.5 | 57.0 | 53.5 | 51.9 | 54.0 | 54.4 |

[1] The standard errors of the estimates are shown in appendix II, table XI.

Table 11. Average T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by grade level with respect to age and selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | WRAT Reading | | | | WRAT Arithmetic | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | Below modal grade | In modal grade | Above modal grade | Total | Below modal grade | In modal grade | Above modal grade |
| | Average T score[1] | | | | | | | |
| All youths, 12-17 years | 50.0 | 45.2 | 52.6 | 55.6 | 50.0 | 46.0 | 52.2 | 54.8 |
| Place of residence | | | | | | | | |
| Urbanized areas | 50.8 | 44.7 | 52.9 | 56.9 | 49.8 | 45.0 | 51.6 | 54.8 |
| Urban, other | 49.9 | 46.6 | 52.9 | 53.7 | 51.1 | 47.9 | 54.0 | 56.1 |
| Rural areas | 49.0 | 45.1 | 52.0 | 53.6 | 49.7 | 46.3 | 52.4 | 54.5 |
| Rate of population change | | | | | | | | |
| Loss | 48.2 | 41.7 | 51.1 | 54.0 | 49.5 | 43.2 | 52.6 | 54.9 |
| Below average gain | 50.0 | 46.7 | 52.7 | 56.0 | 49.5 | 47.1 | 51.4 | 54.8 |
| Average gain | 49.4 | 43.6 | 52.1 | 56.5 | 48.7 | 44.2 | 51.0 | 54.3 |
| Above average gain | 52.2 | 47.9 | 54.1 | 56.3 | 52.0 | 48.9 | 53.3 | 55.2 |
| Race | | | | | | | | |
| White | 51.3 | 46.6 | 53.6 | 56.4 | 51.3 | 47.4 | 53.2 | 55.6 |
| Black | 41.6 | 38.3 | 44.7 | 47.2 | 41.1 | 38.9 | 43.4 | 45.0 |
| Geographic region | | | | | | | | |
| Northeast | 52.3 | 45.9 | 53.2 | 57.6 | 51.1 | 46.8 | 51.6 | 55.7 |
| Midwest | 51.8 | 47.4 | 53.3 | 56.0 | 51.5 | 48.6 | 52.5 | 55.1 |
| South | 46.0 | 42.0 | 50.2 | 49.3 | 46.8 | 43.3 | 50.8 | 50.8 |
| West | 49.9 | 46.2 | 53.2 | 53.5 | 50.2 | 46.4 | 53.6 | 54.5 |
| Annual family income | | | | | | | | |
| Less than $5,000 | 44.0 | 40.4 | 47.8 | 49.9 | 44.4 | 41.5 | 47.7 | 50.3 |
| $5,000-$9,999 | 50.5 | 46.2 | 52.6 | 55.4 | 50.5 | 47.0 | 52.2 | 54.6 |
| $10,000 or more | 54.8 | 50.6 | 55.7 | 58.1 | 54.4 | 51.3 | 55.0 | 56.8 |

[1] The standard errors of the estimates are shown in appendix II, table XII.

Table 12. Percent distribution of youths 12-17 years by type of early school attended and age started first grade, according to selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | Total | Early school attendance | | | | Total | Age started first grade (in years) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Both nursery school and kindergarten | Kindergarten only | Nursery school only | Neither | | 5 or under | 6 | 7 or over |
| | Percent distribution | | | | | | | | |
| All youths, 12-17 years | 100.0 | 8.5 | 57.4 | 0.8 | 33.4 | 100.0 | 19.9 | 74.4 | 5.7 |
| **Education of parent** | | | | | | | | | |
| Elementary school | 100.0 | 3.8 | 40.6 | 0.6 | 55.0 | 100.0 | 14.9 | 74.8 | 10.3 |
| 9th - 11th grade | 100.0 | 5.1 | 61.2 | 0.9 | 32.8 | 100.0 | 19.2 | 75.8 | 5.0 |
| 12th grade | 100.0 | 7.5 | 66.7 | 0.9 | 24.8 | 100.0 | 22.4 | 74.0 | 3.6 |
| Higher than 12th grade | 100.0 | 19.1 | 64.4 | 0.7 | 15.7 | 100.0 | 23.0 | 74.0 | 3.1 |
| **Annual family income** | | | | | | | | | |
| Less than $5,000 | 100.0 | 4.8 | 40.5 | 0.8 | 53.9 | 100.0 | 14.4 | 74.9 | 10.8 |
| $5,000-$9,999 | 100.0 | 5.1 | 62.4 | 0.7 | 31.9 | 100.0 | 20.7 | 75.1 | 4.3 |
| $10,000 or more | 100.0 | 15.8 | 65.4 | 0.9 | 17.9 | 100.0 | 22.7 | 74.1 | 3.2 |
| **Place of residence** | | | | | | | | | |
| Urbanized areas | 100.0 | 11.6 | 66.0 | 0.9 | 21.5 | 100.0 | 22.7 | 72.7 | 4.6 |
| Urban, other | 100.0 | 6.3 | 57.9 | 0.6 | 35.2 | 100.0 | 17.2 | 75.7 | 7.1 |
| Rural areas | 100.0 | 5.0 | 45.2 | 0.6 | 49.1 | 100.0 | 17.2 | 76.2 | 6.6 |
| **Rate of population change** | | | | | | | | | |
| Loss | 100.0 | 3.9 | 44.1 | 0.3 | 51.8 | 100.0 | 20.0 | 73.0 | 7.0 |
| Below average gain | 100.0 | 6.3 | 61.4 | 0.6 | 31.7 | 100.0 | 19.2 | 74.5 | 6.2 |
| Average gain | 100.0 | 8.6 | 59.4 | 0.9 | 31.1 | 100.0 | 19.2 | 74.9 | 5.9 |
| Above average gain | 100.0 | 14.3 | 63.7 | 1.2 | 20.8 | 100.0 | 21.0 | 75.0 | 3.9 |
| **Race** | | | | | | | | | |
| White | 100.0 | 8.8 | 58.8 | 0.8 | 31.6 | 100.0 | 20.1 | 74.3 | 5.6 |
| Black | 100.0 | 5.9 | 48.5 | 0.6 | 45.1 | 100.0 | 18.2 | 75.5 | 6.3 |
| **Geographic region** | | | | | | | | | |
| Northeast | 100.0 | 9.0 | 67.1 | 0.9 | 23.0 | 100.0 | 27.8 | 68.6 | 3.6 |
| Midwest | 100.0 | 7.0 | 75.3 | 0.4 | 17.3 | 100.0 | 20.1 | 76.0 | 4.0 |
| South | 100.0 | 7.1 | 23.4 | 1.3 | 68.2 | 100.0 | 13.0 | 78.1 | 8.9 |
| West | 100.0 | 11.0 | 60.1 | 0.6 | 28.3 | 100.0 | 19.3 | 74.2 | 6.4 |

Table 13. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by type of early school attended and selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | WISC Vocabulary | | | | WISC Block Design | | | |
|---|---|---|---|---|---|---|---|---|
| | Both nursery school and kindergarten | Kindergarten only | Nursery school only | Neither | Both nursery school and kindergarten | Kindergarten only | Nursery school only | Neither |
| | Average T score[1] | | | | | | | |
| All youths, 12-17 years | 54.9 | 51.5 | 51.6 | 46.3 | 52.6 | 51.3 | 49.1 | 47.2 |
| **Education of parent** | | | | | | | | |
| Elementary school | 49.0 | 46.9 | 42.9 | 42.1 | 47.3 | 48.0 | 42.6 | 44.1 |
| 9th - 11th grade | 51.2 | 48.9 | 51.9 | 47.4 | 51.6 | 48.8 | 46.1 | 47.9 |
| 12th grade | 52.4 | 52.9 | 54.5 | 51.1 | 50.0 | 52.6 | 51.5 | 51.2 |
| Higher than 12th grade | 58.6 | 56.1 | 55.0 | 54.7 | 55.6 | 54.4 | 55.0 | 53.1 |
| **Annual family income** | | | | | | | | |
| Less than $5,000 | 46.6 | 46.5 | 46.0 | 41.6 | 46.3 | 46.5 | 43.2 | 43.5 |
| $5,000-$9,999 | 53.5 | 51.1 | 52.9 | 49.0 | 52.6 | 51.4 | 50.2 | 49.4 |
| $10,000 or more | 57.4 | 55.0 | 54.0 | 52.3 | 54.2 | 53.8 | 52.4 | 52.4 |
| **Place of residence** | | | | | | | | |
| Urbanized areas | 54.8 | 51.3 | 51.9 | 46.7 | 52.7 | 50.8 | 48.6 | 47.3 |
| Urban, other | 53.3 | 51.6 | 46.8 | 46.3 | 51.1 | 51.5 | 44.0 | 48.1 |
| Rural areas | 55.7 | 51.8 | 52.5 | 46.0 | 52.9 | 52.1 | 51.9 | 46.8 |
| **Rate of population change** | | | | | | | | |
| Loss | 55.9 | 52.0 | 60.0 | 45.5 | 52.8 | 51.3 | 51.2 | 45.8 |
| Below average gain | 54.9 | 50.4 | 46.2 | 46.3 | 52.9 | 51.0 | 41.8 | 48.3 |
| Average gain | 52.6 | 50.1 | 50.0 | 44.6 | 51.2 | 50.1 | 50.8 | 45.6 |
| Above average gain | 55.8 | 53.3 | 53.3 | 50.0 | 53.1 | 52.4 | 50.9 | 50.7 |
| **Race** | | | | | | | | |
| White | 55.8 | 52.5 | 52.8 | 47.7 | 53.4 | 52.2 | 50.5 | 48.7 |
| Black | 44.6 | 44.3 | 39.9 | 39.8 | 43.4 | 43.4 | 36.3 | 40.3 |
| **Geographic region** | | | | | | | | |
| Northeast | 58.2 | 53.5 | 50.3 | 49.5 | 53.4 | 51.5 | 46.4 | 48.9 |
| Midwest | 54.7 | 50.9 | 52.2 | 50.8 | 53.0 | 52.1 | 54.6 | 51.1 |
| South | 54.6 | 50.5 | 53.8 | 44.1 | 51.8 | 49.2 | 49.7 | 44.6 |
| West | 52.8 | 50.8 | 47.9 | 45.9 | 52.2 | 50.6 | 47.3 | 49.0 |

[1] The standard errors of the estimates are shown in appendix II, table XIII.

Table 14. Average T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by type of early school attended and selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | WRAT Reading | | | | WRAT Arithmetic | | | |
|---|---|---|---|---|---|---|---|---|
| | Both nursery school and kindergarten | Kindergarten only | Nursery school only | Neither | Both nursery school and kindergarten | Kindergarten only | Nursery school only | Neither |
| | Average T score[1] | | | | | | | |
| All youths, 12-17 years | 54.0 | 51.6 | 49.9 | 46.4 | 53.0 | 51.2 | 46.9 | 47.4 |
| Education of parent | | | | | | | | |
| Elementary school | 46.9 | 47.1 | 43.4 | 43.1 | 47.2 | 47.5 | 42.9 | 43.9 |
| 9th - 11th grade | 50.2 | 49.1 | 48.1 | 47.1 | 49.6 | 49.1 | 45.1 | 48.2 |
| 12th grade | 51.4 | 52.9 | 51.3 | 50.5 | 51.7 | 52.3 | 46.8 | 51.3 |
| Higher than 12th grade | 58.3 | 56.1 | 56.3 | 53.6 | 56.2 | 54.8 | 53.3 | 55.0 |
| Annual family income | | | | | | | | |
| Less than $5,000 | 45.0 | 46.2 | 44.3 | 42.2 | 44.4 | 46.0 | 40.3 | 43.3 |
| $5,000-$9,999 | 51.9 | 51.4 | 49.9 | 48.9 | 52.6 | 51.0 | 46.5 | 49.4 |
| $10,000 or more | 57.2 | 55.0 | 53.3 | 52.2 | 55.4 | 54.4 | 51.0 | 53.5 |
| Place of residence | | | | | | | | |
| Urbanized areas | 54.1 | 51.6 | 50.5 | 46.6 | 52.8 | 50.5 | 47.8 | 46.4 |
| Urban, other | 53.1 | 51.4 | 41.2 | 47.1 | 54.0 | 52.5 | 38.4 | 48.5 |
| Rural areas | 54.3 | 51.7 | 51.7 | 46.1 | 53.2 | 51.9 | 48.1 | 47.4 |
| Rate of population change | | | | | | | | |
| Loss | 54.2 | 51.0 | 60.0 | 45.4 | 54.0 | 51.3 | 53.0 | 47.7 |
| Below average gain | 53.8 | 51.2 | 44.7 | 47.3 | 53.1 | 50.1 | 43.9 | 47.8 |
| Average gain | 53.0 | 51.2 | 49.0 | 44.9 | 51.1 | 50.6 | 46.9 | 44.5 |
| Above average gain | 54.7 | 52.7 | 50.9 | 49.4 | 53.8 | 52.4 | 47.1 | 49.8 |
| Race | | | | | | | | |
| White | 55.1 | 52.6 | 51.7 | 48.0 | 54.1 | 52.2 | 48.4 | 49.1 |
| Black | 42.0 | 44.1 | 33.8 | 38.9 | 40.8 | 43.2 | 33.7 | 39.0 |
| Geographic region | | | | | | | | |
| Northeast | 56.3 | 53.1 | 50.1 | 48.7 | 54.1 | 51.9 | 41.8 | 48.3 |
| Midwest | 55.3 | 51.8 | 54.4 | 50.6 | 53.9 | 51.2 | 52.4 | 52.6 |
| South | 53.2 | 49.9 | 50.4 | 43.9 | 53.2 | 49.9 | 48.4 | 45.1 |
| West | 52.1 | 50.5 | 45.4 | 47.7 | 51.6 | 50.9 | 46.5 | 48.2 |

[1]The standard errors of the estimates are shown in appendix II, table XIV.

Table 15. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by age they started first grade and selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | WISC Vocabulary | | | | WISC Block Design | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | 5 years or under | 6 years | 7 years or over | Total | 5 years or under | 6 years | 7 years or over |
| | Average T score[1] | | | | | | | |
| All youths, 12-17 years | 50.0 | 52.1 | 50.1 | 42.5 | 50.0 | 51.3 | 50.0 | 45.2 |
| **Grade level for age** | | | | | | | | |
| Above modal grade | 54.6 | 55.7 | 53.8 | * | 53.1 | 54.0 | 52.5 | * |
| In modal grade | 52.4 | 52.8 | 52.5 | 48.0 | 51.6 | 51.8 | 51.6 | 48.8 |
| Below modal grade | 45.8 | 45.8 | 46.6 | 41.4 | 47.1 | 46.8 | 47.6 | 44.5 |
| **Education of parent** | | | | | | | | |
| Elementary school | 44.3 | 47.2 | 44.5 | 39.1 | 45.8 | 47.0 | 46.1 | 42.5 |
| 9th - 11th grade | 48.6 | 50.1 | 48.6 | 42.8 | 48.6 | 49.9 | 48.4 | 46.0 |
| 12th grade | 52.4 | 53.4 | 52.4 | 48.5 | 52.1 | 52.7 | 52.0 | 50.1 |
| Higher than 12th grade | 56.4 | 56.5 | 56.6 | 49.8 | 54.4 | 54.7 | 54.5 | 50.3 |
| **Annual family income** | | | | | | | | |
| Less than $5,000 | 43.8 | 45.4 | 44.3 | 38.7 | 44.9 | 45.7 | 45.1 | 42.0 |
| $5,000-$9,999 | 50.5 | 52.1 | 50.5 | 45.6 | 50.7 | 51.8 | 50.7 | 47.5 |
| $10,000 or more | 54.9 | 55.8 | 54.9 | 49.2 | 53.5 | 54.2 | 53.5 | 51.5 |
| **Place of residence** | | | | | | | | |
| Urbanized areas | 50.7 | 52.4 | 50.7 | 44.5 | 50.2 | 51.3 | 50.2 | 46.8 |
| Urban, other | 49.8 | 52.3 | 50.3 | 39.5 | 50.2 | 51.6 | 50.4 | 45.8 |
| Rural areas | 49.1 | 51.4 | 49.3 | 42.0 | 49.5 | 51.3 | 49.7 | 43.5 |
| **Rate of population change** | | | | | | | | |
| Loss | 48.8 | 51.3 | 49.0 | 41.5 | 48.5 | 50.9 | 48.6 | 41.8 |
| Below average gain | 49.3 | 52.1 | 49.5 | 40.4 | 50.2 | 51.5 | 50.2 | 46.8 |
| Average gain | 48.6 | 50.4 | 48.6 | 43.5 | 48.8 | 49.8 | 48.9 | 44.9 |
| Above average gain | 52.9 | 54.1 | 53.1 | 45.8 | 52.1 | 52.8 | 52.1 | 48.7 |
| **Race** | | | | | | | | |
| White | 51.2 | 53.1 | 51.4 | 43.4 | 51.2 | 52.3 | 51.2 | 46.4 |
| Black | 42.3 | 44.5 | 42.1 | 38.1 | 42.0 | 43.6 | 42.0 | 38.3 |
| **Geographic region** | | | | | | | | |
| Northeast | 52.9 | 53.6 | 53.3 | 43.8 | 51.0 | 51.2 | 51.3 | 45.3 |
| Midwest | 51.0 | 52.0 | 51.1 | 47.7 | 51.9 | 52.6 | 52.0 | 49.8 |
| South | 46.4 | 49.9 | 46.5 | 41.3 | 46.3 | 48.6 | 46.4 | 42.2 |
| West | 49.7 | 51.5 | 50.0 | 40.0 | 50.3 | 51.7 | 50.4 | 45.8 |

[1] The standard errors of the estimates are shown in appendix II, table XV.

Table 16. Average T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by age they started first grade and selected demographic or socioeconomic characteristics: United States, 1966-70

| Demographic or socioeconomic characteristic | WRAT Reading | | | | WRAT Arithmetic | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | 5 years or under | 6 years | 7 years or over | Total | 5 years or under | 6 years | 7 years or over |
| | Average T score[1] | | | | | | | |
| All youths, 12-17 years | 50.0 | 51.9 | 50.1 | 43.8 | 50.0 | 51.4 | 50.1 | 44.5 |
| **Grade level for age** | | | | | | | | |
| Above modal grade | 55.6 | 56.7 | 54.8 | * | 54.8 | 55.4 | 54.3 | * |
| In modal grade | 52.6 | 52.4 | 52.8 | 49.6 | 52.2 | 52.1 | 52.3 | 49.4 |
| Below modal grade | 45.2 | 44.0 | 45.8 | 42.6 | 46.0 | 44.8 | 46.7 | 43.5 |
| **Education of parent** | | | | | | | | |
| Elementary school | 44.8 | 46.9 | 45.1 | 40.9 | 45.4 | 47.3 | 45.5 | 42.2 |
| 9th - 11th grade | 48.4 | 49.4 | 48.5 | 43.0 | 48.8 | 49.8 | 48.9 | 43.2 |
| 12th grade | 52.1 | 53.0 | 52.1 | 48.8 | 51.9 | 52.3 | 52.0 | 49.2 |
| Higher than 12th grade | 56.1 | 57.0 | 56.1 | 51.9 | 55.1 | 55.4 | 55.2 | 51.6 |
| **Annual family income** | | | | | | | | |
| Less than $5,000 | 44.0 | 45.1 | 44.4 | 40.2 | 44.4 | 44.6 | 44.8 | 41.2 |
| $5,000-$9,999 | 50.5 | 51.7 | 50.6 | 46.3 | 50.5 | 51.4 | 50.6 | 46.4 |
| $10,000 or more | 54.8 | 55.7 | 54.7 | 51.3 | 54.4 | 55.2 | 54.3 | 51.3 |
| **Place of residence** | | | | | | | | |
| Urbanized areas | 50.8 | 52.3 | 50.7 | 45.7 | 49.8 | 50.9 | 49.8 | 46.4 |
| Urban, other | 49.9 | 51.7 | 50.3 | 42.8 | 51.1 | 53.6 | 51.4 | 43.3 |
| Rural areas | 49.0 | 51.1 | 49.2 | 42.5 | 49.7 | 51.5 | 50.0 | 43.2 |
| **Rate of population change** | | | | | | | | |
| Loss | 48.2 | 50.0 | 48.5 | 41.3 | 49.5 | 51.4 | 49.7 | 43.3 |
| Below average gain | 50.0 | 52.2 | 50.0 | 44.6 | 49.5 | 50.8 | 49.6 | 44.6 |
| Average gain | 49.4 | 51.9 | 49.2 | 45.1 | 48.7 | 50.7 | 48.6 | 44.6 |
| Above average gain | 52.2 | 53.1 | 52.4 | 45.1 | 52.0 | 52.5 | 52.2 | 46.3 |
| **Race** | | | | | | | | |
| White | 51.3 | 53.0 | 51.4 | 44.9 | 51.3 | 52.6 | 51.5 | 45.7 |
| Black | 41.6 | 43.2 | 41.5 | 37.7 | 41.1 | 42.7 | 41.0 | 38.9 |
| **Geographic region** | | | | | | | | |
| Northeast | 52.3 | 53.4 | 52.3 | 45.4 | 51.1 | 52.2 | 51.1 | 45.6 |
| Midwest | 51.8 | 52.7 | 51.9 | 48.8 | 51.5 | 51.9 | 51.7 | 49.9 |
| South | 46.0 | 48.3 | 46.2 | 41.1 | 46.8 | 49.0 | 47.0 | 42.2 |
| West | 49.9 | 51.2 | 50.1 | 43.1 | 50.2 | 51.3 | 50.5 | 43.4 |

[1] The standard errors of the estimates are shown in appendix II, table XVI.

Table 17. Average T score equivalents of raw scores on the WISC Vocabulary and Block Design and combined subtests and the WRAT Arithmetic and Reading and combined subtests for youths 12-17 years, by race, family income, and education of parent, with standard errors for totals: United States, 1966-70[1]

| Annual family income and education of parent | WISC | | | | | | WRAT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Vocabulary | | Block Design | | Composite | | Reading | | Arithmetic | | Composite | |
| | White | Black | White | Black | White | Black | White | Black | White | Black | White | Black |
| | Average T score[2] | | | | | | | | | | | |
| All youths, 12-17 years | 51.2 | 42.3 | 51.2 | 42.0 | 102.0 | 86.5 | 51.3 | 41.6 | 51.3 | 41.1 | 102.1 | 85.8 |
| Income less than $5,000 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 42.4 | 39.5 | 44.9 | 39.5 | 89.1 | 82.0 | 43.6 | 39.1 | 44.7 | 38.5 | 90.4 | 81.8 |
| 9th - 11th grade | 46.3 | 42.0 | 47.8 | 41.9 | 94.9 | 86.2 | 45.9 | 40.9 | 46.8 | 41.1 | 94.0 | 85.3 |
| 12th grade | 51.4 | 45.2 | 50.4 | 44.4 | 101.5 | 91.0 | 51.1 | 43.3 | 51.0 | 42.8 | 101.8 | 88.5 |
| Higher than 12th grade | 53.6 | 48.7 | 52.0 | 42.7 | 104.8 | 92.6 | 53.3 | 48.9 | 51.6 | 43.3 | 103.8 | 93.5 |
| Income of $5,000-$9,999 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 48.0 | 41.9 | 49.1 | 42.3 | 97.5 | 86.3 | 48.2 | 42.0 | 48.6 | 42.3 | 97.3 | 87.2 |
| 9th - 11th grade | 50.2 | 43.1 | 50.4 | 42.5 | 100.5 | 87.8 | 50.4 | 42.1 | 50.5 | 41.3 | 100.7 | 86.4 |
| 12th grade | 52.5 | 48.0 | 52.6 | 46.9 | 104.4 | 95.6 | 52.5 | 46.3 | 52.4 | 44.6 | 103.9 | 92.6 |
| Higher than 12th grade | 55.4 | 47.3 | 54.1 | 47.5 | 108.2 | 95.5 | 54.7 | 49.8 | 54.2 | 46.1 | 107.3 | 96.8 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 49.8 | 42.4 | 51.5 | 43.2 | 101.2 | 87.6 | 51.3 | 39.5 | 51.5 | 42.5 | 102.3 | 85.0 |
| 9th - 11th grade | 52.7 | * | 51.4 | * | 103.5 | 91.1 | 52.8 | * | 53.6 | * | 105.3 | * |
| 12th grade | 54.0 | 44.3 | 53.4 | 45.1 | 106.4 | 91.0 | 53.8 | 43.9 | 53.5 | 43.8 | 105.9 | 89.9 |
| Higher than 12th grade | 57.6 | 45.8 | 55.1 | 45.2 | 110.9 | 92.5 | 57.4 | 46.0 | 56.1 | 45.2 | 111.1 | 92.9 |
| | Standard error of T score[2] | | | | | | | | | | | |
| All youths, 12-17 years | 0.62 | 0.55 | 0.29 | 0.47 | 0.76 | 0.81 | 0.38 | 0.31 | 0.45 | 0.48 | 0.65 | 0.62 |

[1]Scores are not shown for youths reported as other than white or black because the number in the sample was too small to provide reliable estimates for the various subgroupings according to income and education of parent.

[2]The standard errors of the estimates for the subgroups are shown in appendix II, table XVII.

**Table 18. Average T-score equivalents of raw scores on the WISC Vocabulary and Block Design and combined subtests for youths 12-17 years, by geographic region, family income, and education, with standard errors for totals: United States, 1966-70**

| Annual family income and education of parent | WISC Vocabulary | | | | WISC Block Design | | | | WISC Composite | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North-east | Mid-west | South | West | North-east | Mid-west | South | West | North-east | Mid-west | South | West |
| | Average T score | | | | | | | | | | | |
| All youths, 12-17 years | 52.9 | 51.0 | 46.4 | 49.7 | 51.0 | 51.9 | 46.3 | 50.3 | 103.4 | 102.5 | 93.7 | 100.0 |
| Income less than $5,000 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 45.7 | 45.0 | 40.1 | 40.9 | 45.8 | 46.4 | 41.2 | 45.5 | 92.8 | 92.6 | 83.9 | 88.3 |
| 9th - 11th grade | 45.5 | 45.7 | 42.8 | 45.2 | 47.1 | 46.7 | 41.6 | 47.7 | 93.6 | 93.6 | 86.6 | 93.9 |
| 12th grade | 54.0 | 50.4 | 45.7 | 49.1 | 51.6 | 49.8 | 45.0 | 48.5 | 104.7 | 100.1 | 91.9 | 97.9 |
| Higher than 12th grade | 47.5 | 49.7 | 55.6 | 53.4 | 45.8 | 53.8 | 48.7 | 49.1 | 94.5 | 102.9 | 103.6 | 102.2 |
| Income of $5,000-$9,999 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 48.1 | 48.0 | 44.6 | 47.8 | 47.5 | 50.0 | 45.3 | 48.7 | 96.2 | 98.3 | 91.4 | 97.0 |
| 9th - 11th grade | 50.8 | 49.3 | 48.1 | 47.9 | 49.2 | 50.8 | 48.3 | 48.3 | 100.1 | 100.1 | 97.0 | 96.7 |
| 12th grade | 54.1 | 52.0 | 51.4 | 51.1 | 52.2 | 52.8 | 51.5 | 52.1 | 105.4 | 104.1 | 102.5 | 102.8 |
| Higher than 12th grade | 58.5 | 55.3 | 52.5 | 53.4 | 55.4 | 56.0 | 51.3 | 52.4 | 111.9 | 109.7 | 103.2 | 105.1 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 49.6 | 49.7 | 47.2 | 49.7 | 50.4 | 51.9 | 48.9 | 50.7 | 99.9 | 101.5 | 96.6 | 100.4 |
| 9th - 12th grade | 53.7 | 51.8 | 52.2 | 52.1 | 52.5 | 51.6 | 48.5 | 50.4 | 105.4 | 103.0 | 100.5 | 102.1 |
| 12th grade | 56.5 | 52.5 | 53.7 | 53.4 | 52.1 | 54.0 | 52.9 | 53.0 | 107.4 | 105.6 | 105.7 | 105.5 |
| Higher than 12th grade | 59.7 | 55.4 | 58.9 | 56.6 | 55.6 | 54.5 | 55.7 | 54.6 | 113.1 | 108.5 | 112.5 | 109.6 |
| | Standard error of T score[1] | | | | | | | | | | | |
| All youths, 12-17 years | 0.88 | 1.22 | 0.98 | 1.37 | 0.62 | 0.51 | 0.86 | 0.70 | 1.23 | 1.47 | 1.55 | 1.71 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table XVIII.

Table 19. Average T-score equivalents of raw scores on the WRAT Arithmetic and Reading and combined subtests for youths 12-17 years, by geographic region, family income, and education of parent, with standard errors for totals: United States, 1966-70

| Annual family income and education of parent | WRAT Reading | | | | WRAT Arithmetic | | | | WRAT Composite | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Northeast | Midwest | South | West | Northeast | Midwest | South | West | Northeast | Midwest | South | West |
| | Average T score | | | | | | | | | | | |
| All youths, 12-17 years | 52.3 | 51.8 | 46.0 | 49.9 | 51.1 | 51.5 | 46.8 | 50.2 | 102.8 | 102.7 | 94.1 | 100.0 |
| Income less than $5,000 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 45.5 | 46.0 | 40.3 | 43.1 | 45.3 | 46.2 | 41.1 | 44.2 | 92.5 | 93.6 | 84.7 | 89.7 |
| 9th - 11th grade | 44.7 | 45.2 | 41.5 | 45.2 | 43.5 | 46.3 | 43.6 | 45.2 | 90.4 | 93.0 | 87.8 | 92.1 |
| 12th grade | 52.5 | 50.0 | 44.7 | 48.5 | 49.8 | 50.8 | 45.8 | 48.1 | 102.0 | 100.8 | 92.1 | 97.3 |
| Higher than 12th grade | 50.4 | 51.0 | 52.5 | 53.7 | 45.0 | 50.0 | 50.9 | 49.9 | 96.3 | 100.8 | 102.4 | 102.7 |
| Income of $5,000-$9,999 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 47.6 | 48.1 | 44.7 | 48.6 | 48.0 | 48.7 | 45.7 | 48.1 | 96.3 | 97.4 | 92.1 | 97.2 |
| 9th - 11th grade | 50.6 | 50.1 | 47.3 | 48.3 | 49.4 | 50.3 | 48.0 | 48.7 | 100.0 | 100.3 | 96.1 | 97.6 |
| 12th grade | 53.1 | 52.6 | 50.8 | 51.1 | 52.1 | 52.2 | 51.9 | 51.2 | 104.3 | 103.9 | 102.2 | 101.9 |
| Higher than 12th grade | 57.4 | 55.5 | 51.9 | 52.9 | 56.4 | 54.3 | 52.2 | 52.6 | 111.3 | 108.1 | 103.4 | 104.5 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 50.9 | 51.0 | 47.6 | 50.3 | 49.2 | 52.0 | 48.9 | 51.3 | 100.0 | 102.5 | 97.0 | 101.4 |
| 9th - 11th grade | 54.1 | 53.2 | 51.3 | 50.7 | 54.8 | 53.1 | 52.6 | 53.0 | 107.2 | 105.2 | 103.3 | 103.0 |
| 12th grade | 55.0 | 54.0 | 52.0 | 52.1 | 54.3 | 52.7 | 53.7 | 53.3 | 107.6 | 105.4 | 104.6 | 104.4 |
| Higher than 12th grade | 58.8 | 56.6 | 57.9 | 56.1 | 55.8 | 55.4 | 57.5 | 55.8 | 112.0 | 109.9 | 112.6 | 109.7 |
| | Standard error of T score[1] | | | | | | | | | | | |
| All youths, 12-17 years | 0.79 | 0.76 | 0.80 | 0.64 | 1.11 | 1.02 | 0.77 | 0.64 | 1.52 | 1.42 | 1.27 | 0.99 |

[1] The standard errors of the estimates for the subgroups are shown in appendix II, table XIX.

# APPENDIX I

# STATISTICAL NOTES

### The Survey Design

The sample designs for the first three programs, Cycles I-III, of the Health Examination Survey were essentially similar in that each was a multistage, stratified probability sample of clusters of households in land-based segments. The successive elements for this sample design are primary sampling unit (PSU), census enumeration district (ED), segment (a cluster of households), household, eligible youths, and finally, the sample youth.

The 40 sample areas and the segments utilized in the design of Cycle III were the same as those used in Cycle II. Previous reports describe in detail the sample design used for Cycle II and in addition discuss the problems and considerations given to other types of sampling frames and to the issue of controlling the selection of siblings.[6,7]

Requirements and limitations placed on the design for Cycle III, similar to those for the design for Cycle II, were as follows:

1. The target population was defined as the civilian, noninstitutionalized population of the United States (including Alaska and Hawaii) in the age range of 12-17 years with the special exclusion of children residing on reservation lands of the American Indians, an exclusion adopted as a result of operational problems encountered on these lands during Cycle I.

2. The time period of data collection was limited to about 3 years, and the length of the individual examination within the specially constructed mobile examination center was between 2 and 3 hours.

3. Ancillary data were collected on specially designed household, medical history, and school questionnaires and from copies of birth certificates.

4. Examination objectives were related primarily to factors of physical and intellectual growth and development.

5. The sample was sufficiently large to yield reliable findings within broad geographic regions and population density groups as well as within age, sex, and limited socioeconomic groups for the total sample.

The sample was drawn jointly with the U.S. Bureau of the Census, beginning with the 1960 decennial census list of addresses and the nearly 1,900 PSU's into which the entire United States was divided. Each PSU is either a standard metropolitan statistical area, a county, or a group of two or three contiguous counties. These PSU's were grouped into 40 strata so that each stratum had an average size of about 4.5 million persons, and the grouping was done so as to maximize the degree of homogeneity within strata with regard to the population size of the PSU's, degree of urbanization, geographic proximity, and degree of industrialization. The 40 strata were then classified into four broad geographic regions of 10 strata each, next cross-classified within each region by four population density classes and classes of rate of population change from 1950 to 1960. Using a

modified Goodman-Kish controlled-selection technique, one PSU was drawn from each of the 40 strata.

Generally, within each PSU, 20 ED's were selected with the probability of selection of a particular ED proportional to its population in the age group 5-9 years in the 1960 census, which by 1966 approximated the target population for Cycle III. A similar method was used for selecting one segment (a smaller cluster of households) in each ED. Because of the approximately 3-year time interval between Cycle II and Cycle III, the Cycle III sampling frame was updated for new construction and to compensate for segments where housing was partially or totally demolished to make room for highway construction or urban redevelopment. Each of the resulting 20 segments within a PSU was either a bounded area or a cluster of households (or addresses). All the youths in the appropriate age range who resided at the addresses visited were eligible youths; that is, those eligible for inclusion in the sample. Operational considerations made it necessary to reduce the number of prospective examinees at any one location to a maximum of 200. When the number of eligible youths in a particular location exceeded this number, the "excess" eligible youths were deleted from the sample through a systematic sampling technique. Youths who were not selected as sample persons in the Cycle III sample, but who had previously been examined in Cycle II, were scheduled for examination if time permitted and will be included in special longitudinal analyses. Individual twins who were deleted from the Cycle III sample were also scheduled for examination, as in Cycle II, to provide data on pairs of twins for future analysis. These data are not included in this report as part of the national probability sample of youths.

The sample was selected in Cycle III, as it had been for the children in Cycle II, so as to contain proportional representation of youths from families having only one eligible youth, two eligible youths, and so on, thus making the sample representative of the total target population. However, since households were one of the elements in the sample frame, the number of related youths in the resulting sample was greater than would result from a design which sampled youths 12-17 years without regard to household. The resulting estimated mean measurements or rates should be unbiased, but their sampling variabilities are somewhat greater than those that would result from a more costly, time-consuming, systematic sample design in which every $k$th youth was selected.

The total probability sample for Cycle III included 7,514 youths representative of the approximately 22.7 million noninstitutionalized U.S. youths of 12-17 years. The sample contained youths from 25 different States, with approximately 1,000 in each single year of age.

The response rate in Cycle III was 90 percent, with 6,768 youths examined out of the total sample. These examinees were closely representative of those in the population from which the sample was drawn with respect to age, sex, race, region, and population density and growth in area of residence. Hence it appears unlikely that nonresponse could bias the findings appreciably.

### Reliability

While measurement processes in the surveys were carefully standardized and closely controlled, the correspondence between true population figures and survey results cannot be expected to be exact. Survey data are imperfect for three major reasons: (1) results are subject to sampling error, (2) the actual conduct of a survey never agrees perfectly with the design, and (3) the measurement processes themselves are inexact even though standardized and controlled.

Data recorded for each sample youth are inflated in the estimation process to characterize the larger universe of which the sample youths are representative. The weights used in this inflation process are a product of the reciprocal of the probability of selecting the youth, an adjustment for nonresponse cases, and a post-stratified ratio adjustment which increases precision by bringing survey results into closer alignment with known U.S. population figures by color and sex within single years of age 12 through 17.

In the third cycle of the Health Examination

Survey (as in Cycle II), the sample was the result of three principal stages of selection--the single PSU from each stratum, the 20 segments from each sample PSU, and the sample youth from the eligible youths. The probability of selecting an individual youth is the product of the probability of selection at each stage.

Since the strata are roughly equal in population size and a nearly equal number of sample youths were examined in each of the sample PSU's, the sample design is essentially self-weighting with respect to the target population; that is, all youths 12 through 17 years of age had about the same probability of being drawn into the sample.

The adjustment upward for nonresponse is intended to minimize the impact of nonresponse on final estimates by imputing to nonrespondents the characteristics of "similar" respondents. Here "similar" respondents are judged to be examined youths in a sample PSU having the same age in years and of the same sex as youths not examined in that sample PSU.

The poststratified ratio adjustment used in the third cycle achieved most of the gains in precision which would have been attained if the sample had been drawn from a population stratified by age, race, and sex and makes the final sample estimates of population agree exactly with independent controls prepared by the U.S. Bureau of the Census for the noninstitutionalized population as of March 9, 1968 (approximate midsurvey point for Cycle III) by race and sex for each single year of age 12 through 17. The weight of every responding sample youth in each of the 24 age, race, and sex classes is adjusted upward or downward so that the weighted total within each class equals the independent population control. Final sample frequencies and estimated population sizes as of the approximate midpoint of the survey are presented in table IV by age and sex.

### Extent of Missing Test Results and Imputation Procedures

In addition to youths who were selected for the sample but, for various reasons, not examined, there were some whose examination was incomplete in one procedure or another. The extent of missing data for the WRAT and WISC is shown in table I according to sex and age. For 109 youths, or 1.6 percent of all those examined, WISC results were not available. The WRAT results were not available for 210 youths, or 3.1 percent of all those examined. There were a number of reasons for this missing data, primarily operational and logistical survey problems such as lost records or lack of time to complete the examination. Since the reason for missing test results in most cases was not directly related to the characteristics being measured, raw scores were imputed for almost all of these examinees. In certain infrequent instances imputation was not considered appropriate, as, for example, the imputation of reading scores for a blind youth or for a foreigh-language-speaking youth who could not understand English well enough to take any of the psychological tests.

Imputation was accomplished in the following manner. An intercorrelation matrix of data collected during the survey, including all psychological test scores and selected socioeconomic items, was derived to identify those variables which were most highly associated with each raw test score. As a result, five variables were chosen for the imputation of WISC and WRAT raw scores: other available test scores, education level of the head of the household (four categories), age, and two control variables--race and sex. Imputation of a missing test result for an examinee was accomplished by randomly selecting a match among the group of examinees with the same age in years, level of parental education, race, sex, and whose available raw score test results most highly correlated with the scores, to be imputed. The raw score of this "matched" examinee was then imputed to the examinee with the missing score. When data for any of these variables were not available, a match was selected using information on as many of the variables as were available in the youth's record.

### Sampling and Measurement Error

In the present report, reference has been made to efforts to minimize bias and variability of measurement techniques. The probability

design of the survey makes possible the calculation of sampling errors. The sampling error is used here to determine how imprecise the survey test results may be because they result from a sample rather than from the measurement of all elements in the population. The estimation of sampling errors for a study of the type of the Health Examination Survey is difficult for at least three reasons: (1) measurement error and "pure" sampling error are confounded in the data, and it is difficult to find a procedure which will either completely include both or treat one or the other separately; (2) the survey design and estimation procedure are complex and accordingly require computationally involved techniques for the calculation of variances; and (3) thousands of statistics are derived from the survey, many for subclasses of the population for which the number of sample cases is small. Estimates of sampling error are obtained from the sample data and are themselves subject to sampling error, which may be large when the number of cases in a cell is small or occasionally even when the number of cases is substantial.

Estimates of the approximate sampling variability for selected statistics used in this report are included in the detailed tables and in appendix II. These estimates, called "standard errors," have been prepared by a replication technique which yields overall variability through observation of variability among random subsamples of the total sample. The method reflects both "pure" sampling variance and a part of the measurement variance, and is described in previously published reports.[37,38]

### Hypothesis Testing

In accordance with usual practice, the interval estimate for any statistic was considered to be the range within one standard error of the tabulated statistic with 68-percent confidence and the range within two standard errors of the tabulated statistics with 95-percent confidence. The latter is used as the level of statistical significance in this report.

An approximation of the standard error of a difference $d = x - y$ of two statistics $x$ and $y$ is given by the formula $S_d = (S_x^2 + S_y^2)^{1/2}$ where $S_x$ and $S_y$ are the sampling errors, respectively, of $x$ and $y$. Of course, where the two groups or measures are positively or negatively correlated, this formula will give an overestimate or underestimate of the actual standard error.

Thus the procedure used in this report for testing the significance of difference between means consisted of dividing the difference between the two means by the standard error of the difference as computed above. If the magnitude of $t$ was greater than 2.00, the difference was considered statistically significant at approximately the 5-percent confidence level. For example, the mean WISC Vocabulary T score for adolescents residing in the Northeast was 52.9, while the mean T score for those residing in the South was 46.4—a difference of 6.5. The approximate standard error of the difference between means was $[(0.88)^2 + (0.98)^2]^{1/2}$, or 1.32. Since the difference between the means was 4.9 times the standard error of the difference between the two means, the difference was considered significant beyond the 5-percent confidence level.

### Small Categories

In some tables estimates have not been shown for certain categories for which the sample size was so small that the relative standard error exceeded 0.25. A few estimates which did not meet this strict standard of precision have been included along with their corresponding standard errors in the belief that the information may add to the overall impression of the survey findings and therefore may be of interest to subject-matter specialists.

Table I. Numbers of missing or unusable records of selected subtests of the WISC and WRAT, by age and sex of youths 12-17 years: United States, 1966-70

| Age and sex | WISC | | | | WRAT | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | Both subtests missing | Vocabulary only missing | Block Design only missing | Total | Both subtests missing | Reading only missing | Arithmetic only missing |
| Both sexes | | | | | | | | |
| 12-17 years | 109 | 71 | 17 | 21 | 210 | 166 | 13 | 31 |
| 12 years | 18 | 12 | 3 | 3 | 42 | 35 | 1 | 6 |
| 13 years | 16 | 8 | 3 | 5 | 37 | 29 | 3 | 5 |
| 14 years | 24 | 15 | 4 | 5 | 44 | 34 | 2 | 8 |
| 15 years | 15 | 11 | 3 | 1 | 30 | 24 | 2 | 4 |
| 16 years | 18 | 11 | 3 | 4 | 27 | 17 | 3 | 7 |
| 17 years | 18 | 14 | 1 | 3 | 30 | 27 | 2 | 1 |
| Boys | | | | | | | | |
| 12-17 years | 60 | 40 | 7 | 13 | 129 | 101 | 6 | 22 |
| 12 years | 9 | 7 | 1 | 1 | 29 | 25 | - | 4 |
| 13 years | 10 | 5 | 1 | 4 | 23 | 16 | 2 | 5 |
| 14 years | 17 | 12 | 2 | 3 | 31 | 23 | 1 | 7 |
| 15 years | 8 | 8 | - | - | 20 | 18 | 1 | 1 |
| 16 years | 7 | 3 | 2 | 2 | 11 | 6 | 1 | 4 |
| 17 years | 9 | 5 | 1 | 3 | 15 | 13 | 1 | 1 |
| Girls | | | | | | | | |
| 12-17 years | 49 | 31 | 10 | 8 | 81 | 65 | 7 | 9 |
| 12 years | 9 | 5 | 2 | 2 | 13 | 10 | 1 | 2 |
| 13 years | 6 | 3 | 2 | 1 | 14 | 13 | 1 | - |
| 14 years | 7 | 3 | 2 | 2 | 13 | 11 | 1 | 1 |
| 15 years | 7 | 3 | 3 | 1 | 10 | 6 | 1 | 3 |
| 16 years | 11 | 8 | 1 | 2 | 16 | 11 | 2 | 3 |
| 17 years | 9 | 9 | - | - | 15 | 14 | 1 | - |

Table II. Percent distribution of youths 12-17 years in the U.S. population by family income and education of parent, according to race and geographic region: United States, 1966-70

[Based on HES sample]

| Annual family income and education of parent | White | | | | | Black | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total | North-east | Mid-west | South | West | Total | North-east | Mid-west | South | West |
| | Percent distribution | | | | | | | | | |
| Total U.S. population | 100.0 | 22.4 | 30.3 | 20.0 | 27.3 | 100.0 | 21.4 | 17.3 | 47.8 | 13.4 |
| Annual family income | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Less than $5,000 | 20.1 | 12.8 | 12.6 | 35.8 | 22.8 | 59.1 | 48.0 | 40.5 | 75.2 | 43.5 |
| $5,000 - $9,999 | 40.0 | 43.4 | 43.3 | 34.0 | 37.9 | 27.5 | 34.9 | 38.1 | 18.1 | 35.4 |
| $10,000 or more | 33.4 | 35.4 | 39.8 | 25.7 | 30.7 | 6.8 | 4.3 | 17.9 | 1.6 | 14.8 |
| Unknown | 6.5 | 8.5 | 4.3 | 4.4 | 8.6 | 6.7 | 12.7 | 3.5 | 5.1 | 6.3 |
| Education of parent | | | | | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Elementary | 25.2 | 18.9 | 21.2 | 39.4 | 24.6 | 43.2 | 30.7 | 28.0 | 58.3 | 29.2 |
| 9th - 11th grade | 18.8 | 21.8 | 20.3 | 16.8 | 16.2 | 28.2 | 35.9 | 28.3 | 22.4 | 36.1 |
| 12th grade | 29.9 | 33.8 | 34.0 | 20.1 | 29.2 | 16.8 | 19.9 | 28.2 | 9.8 | 22.0 |
| Higher than 12th grade | 23.9 | 24.0 | 23.1 | 21.5 | 26.4 | 6.0 | 5.8 | 8.2 | 3.8 | 11.5 |
| Unknown | 2.2 | 1.5 | 1.4 | 2.3 | 3.6 | 5.8 | 7.6 | 7.1 | 5.8 | 1.2 |

Table III. Percent distribution of youths 12-17 years in the U.S. population by family income and education of parent, according to race and type of area: United States, 1966-70

[Based on HES sample]

| Annual family income and education of parent | White | | | Black | | |
|---|---|---|---|---|---|---|
| | Total | Urban | Rural | Total | Urban | Rural |
| | Percent distribution | | | | | |
| Total U.S. population | 100.0 | 61.4 | 38.6 | 100.0 | 78.3 | 21.7 |
| Annual family income | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Less than $5,000 | 20.1 | 16.2 | 26.2 | 59.1 | 56.1 | 69.9 |
| $5,000 - $9,999 | 40.0 | 41.1 | 38.1 | 27.5 | 29.9 | 18.9 |
| $10,000 or more | 33.4 | 37.3 | 27.3 | 6.8 | 8.0 | 2.4 |
| Unknown | 6.5 | 5.4 | 8.3 | 6.7 | 6.1 | 8.9 |
| Education of parent | | | | | | |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Elementary | 25.2 | 19.5 | 34.3 | 43.2 | 38.0 | 61.9 |
| 9th - 11th grade | 18.8 | 19.7 | 17.5 | 28.2 | 31.0 | 18.1 |
| 12th grade | 29.9 | 32.6 | 25.4 | 16.8 | 19.2 | 8.1 |
| Higher than 12th grade | 23.9 | 26.3 | 20.1 | 6.0 | 7.3 | 1.3 |
| Unknown | 2.2 | 1.9 | 2.7 | 5.8 | 4.5 | 10.6 |

Table IV. Number of youths in the sample and estimated number of youths in the U.S. population as of midsurvey, by sex and age: Health Examination Survey, 1966-70

| Age | Number of youths in sample | | | Estimated number of youths in population as of midsurvey in thousands | | |
|---|---|---|---|---|---|---|
| | Total | Boys | Girls | Total | Boys | Girls |
| Total, 12-17 years | 6,768 | 3,545 | 3,223 | 22,692 | 11,489 | 11,203 |
| 12 years | 1,190 | 643 | 547 | 4,002 | 2,032 | 1,970 |
| 13 years | 1,208 | 626 | 582 | 3,952 | 2,006 | 1,946 |
| 14 years | 1,204 | 618 | 586 | 3,852 | 1,951 | 1,901 |
| 15 years | 1,116 | 613 | 503 | 3,751 | 1,900 | 1,851 |
| 16 years | 1,092 | 556 | 536 | 3,625 | 1,836 | 1,789 |
| 17 years | 958 | 489 | 469 | 3,510 | 1,764 | 1,746 |

○○○

# APPENDIX II

# STANDARD ERRORS OF ESTIMATES

Table V. Standard error of T-score equivalents of raw scores on the WISC and WRAT combined subtests for youths 12-17 years, by family income, type of test, and education of parent: United States, 1966-70

[Correspond to data presented in table 4]

| Type of test and education of parent | Total | Annual family income | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Less than $3,000 | $3,000-$4,999 | $5,000-$6,999 | $7,000-$9,999 | $10,000-$14,999 | $15,000 or more | Unknown |
| | Standard error of T score | | | | | | | |
| WISC | | | | | | | | |
| All youths, 12-17 years | 0.67 | 0.96 | 0.71 | 0.77 | 0.76 | 0.52 | 1.13 | 1.23 |
| Education of parent | | | | | | | | |
| None | 2.24 | 3.83 | 3.53 | * | * | ... | ... | * |
| Less than 5 years | 0.95 | 1.35 | 1.78 | 3.78 | 1.81 | * | * | 3.70 |
| 5-7 years | 0.90 | 1.40 | 0.96 | 1.77 | 1.84 | 1.62 | * | 2.55 |
| 8 years | 0.63 | 1.10 | 1.16 | 1.98 | 1.20 | 1.12 | 1.83 | 2.81 |
| 9-11 years | 0.57 | 1.32 | 1.02 | 1.41 | 1.55 | 0.95 | 1.64 | 1.76 |
| 12 years | 0.39 | 1.46 | 1.54 | 0.57 | 0.89 | 0.44 | 1.33 | 1.56 |
| 13-15 years | 0.74 | 3.38 | 3.99 | 2.11 | 1.57 | 0.92 | 1.37 | 1.81 |
| 16 years | 1.25 | * | * | 2.35 | 1.72 | 1.41 | 1.74 | 4.94 |
| 17 years or more | 1.02 | ... | * | 5.49 | 1.66 | 1.94 | 2.35 | 2.92 |
| Unknown | 1.92 | 2.15 | 3.66 | 2.89 | 3.85 | 3.66 | * | 3.32 |
| WRAT | | | | | | | | |
| All youths, 12-17 years | 0.57 | 0.95 | 0.85 | 0.83 | 0.80 | 0.51 | 0.98 | 1.17 |
| Education of parent | | | | | | | | |
| None | 3.42 | 6.44 | 3.49 | * | * | ... | ... | * |
| Less than 5 years | 1.11 | 1.68 | 1.21 | 3.70 | 1.01 | * | * | 4.92 |
| 5-7 years | 0.80 | 2.00 | 1.12 | 1.69 | 2.23 | 3.06 | * | 3.74 |
| 8 years | 0.76 | 1.36 | 1.09 | 1.73 | 1.09 | 1.59 | 2.10 | 2.96 |
| 9-11 years | 0.64 | 1.34 | 1.31 | 1.34 | 1.45 | 1.11 | 2.15 | 1.45 |
| 12 years | 0.56 | 1.59 | 1.47 | 0.73 | 0.94 | 0.46 | 1.56 | 1.18 |
| 13-15 years | 0.74 | 3.54 | 2.71 | 1.84 | 1.22 | 1.20 | 1.24 | 1.59 |
| 16 years | 0.90 | * | * | 2.42 | 1.58 | 1.21 | 1.24 | 2.95 |
| 17 years or more | 1.04 | ... | ... | 6.70 | 2.07 | 1.74 | 1.81 | 1.56 |
| Unknown | 1.42 | 2.74 | 4.09 | 2.56 | 1.98 | 3.95 | * | 4.10 |

Table VI. Standard error of T-score equivalents of raw scores on the WISC and WRAT combined subtests for youths 12-17 years, by type of test, number of persons under 21 in household, family income, and education of parent: United States, 1966-70

[Correspond to data presented in table 5]

| Annual family income and education of parent | WISC Composite | | | | | WRAT Composite | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | One | Two | Three | Four | Five or more | One | Two | Three | Four | Five or more |
| | Standard error of T score | | | | | | | | | |
| All youths, 12-17 years | 0.79 | 0.58 | 0.72 | 0.83 | 1.07 | 0.63 | 0.62 | 0.83 | 0.59 | 0.79 |
| Income less than $5,000 | | | | | | | | | | |
| Education of parent: | | | | | | | | | | |
| Elementary school | 1.26 | 0.91 | 1.84 | 1.85 | 1.24 | 0.95 | 1.07 | 1.72 | 1.52 | 1.07 |
| 9th - 11th grade | 1.91 | 2.25 | 2.44 | 1.80 | 0.93 | 2.32 | 2.07 | 2.93 | 1.92 | 0.87 |
| 12th grade | 2.53 | 2.80 | 2.52 | 2.08 | 2.12 | 2.42 | 2.17 | 2.57 | 1.95 | 2.07 |
| Higher than 12th grade | 2.53 | 4.38 | * | 4.69 | * | 3.96 | 3.79 | * | 7.98 | * |
| Income of $5,000-$9,999 | | | | | | | | | | |
| Education of parent: | | | | | | | | | | |
| Elementary school | 1.83 | 1.19 | 1.92 | 1.66 | 1.52 | 2.02 | 1.35 | 1.77 | 1.53 | 1.51 |
| 9th - 11th grade | 1.79 | 1.08 | 1.48 | 1.35 | 2.56 | 1.54 | 1.18 | 1.79 | 1.13 | 2.64 |
| 12th grade | 0.91 | 0.83 | 0.96 | 1.11 | 1.14 | 1.05 | 0.90 | 1.07 | 1.19 | 1.46 |
| Higher than 12th grade | 1.17 | 1.52 | 2.16 | 1.82 | 1.75 | 1.38 | 1.42 | 2.17 | 1.85 | 1.31 |
| Income of $10,000 or more | | | | | | | | | | |
| Education of parent: | | | | | | | | | | |
| Elementary school | 3.46 | 2.09 | 2.61 | 2.09 | 1.88 | 5.15 | 2.78 | 2.70 | 2.46 | 2.81 |
| 9th - 11th grade | 2.47 | 1.72 | 2.39 | 1.25 | 1.74 | 1.50 | 1.49 | 1.95 | 1.43 | 2.99 |
| 12th grade | 1.34 | 0.81 | 1.35 | 1.24 | 1.20 | 1.25 | 0.81 | 1.16 | 1.93 | 1.12 |
| Higher than 12th grade | 1.82 | 0.74 | 0.80 | 2.07 | 2.67 | 0.94 | 0.75 | 1.02 | 1.45 | 2.65 |

Table VII. Standard error of T-score equivalents of raw scores on the WISC combined subtests for youths 12-17 years, by type of place, size of place, family income, and education of parent: United States, 1966-70

[Correspond to data presented in table 6]

| Annual family income and education of parent | Urbanized areas | | | | Urban places outside urbanized areas | | | Rural areas |
|---|---|---|---|---|---|---|---|---|
| | 3 million persons or more | 1,000,000-2,999,999 persons | 250,000-999,999 persons | Less than 250,000 persons | 25,000 persons or more | 10,000-24,999 persons | 2,500-9,999 persons | |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.74 | 1.84 | 1.44 | 4.27 | 4.48 | 3.51 | 0.90 | 1.14 |
| Income less than $5,000 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 1.28 | 3.20 | 2.58 | 3.62 | 3.86 | * | 2.21 | 1.24 |
| 9th - 11th grade | 2.70 | 2.72 | 5.03 | 1.97 | * | * | 3.09 | 1.63 |
| 12th grade | 1.14 | * | 2.96 | 7.71 | 7.06 | ... | 5.96 | 2.92 |
| Higher than 12th grade | * | * | * | 3.22 | 2.97 | ... | 2.69 | 4.70 |
| Income of $5,000 - $9,999 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 0.97 | 3.11 | 4.58 | 2.90 | 6.52 | 3.34 | 2.28 | 1.34 |
| 9th - 11th grade | 1.20 | 3.94 | 3.39 | 2.56 | 5.60 | 3.16 | 2.27 | 1.99 |
| 12th grade | 0.75 | 2.40 | 2.53 | 2.06 | 2.31 | 2.02 | 1.60 | 0.69 |
| Higher than 12th grade | 1.54 | 3.43 | 3.04 | 6.05 | 1.83 | 7.25 | 1.84 | 1.56 |
| Income of $10,000 or more | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 2.42 | * | 7.96 | 3.50 | 6.45 | * | 5.64 | 1.27 |
| 9th - 11th grade | 2.22 | 2.82 | 3.91 | 4.39 | 2.13 | * | 4.23 | 1.30 |
| 12th grade | 1.02 | 0.55 | 1.93 | * | 4.36 | * | 0.90 | 1.29 |
| Higher than 12th grade | 0.73 | 1.26 | 1.81 | 5.46 | 3.27 | * | 2.37 | 2.32 |

Table VIII. Standard error of T-score equivalents of raw scores on the WRAT combined subtests for youths 12-17 years, by type of place, size of place, family income, and education of parent: United States, 1966-70

[Correspond to data presented in table 7]

| Annual family income and education of parent | Urbanized areas | | | | Urban places outside urbanized areas | | | Rural areas |
|---|---|---|---|---|---|---|---|---|
| | 3 million persons or more | 1,000,000-2,999,999 persons | 250,000-999,999 persons | Less than 250,000 persons | 25,000 persons or more | 10,000-24,999 persons | 2,500-9,999 persons | |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.82 | 1.07 | 1.04 | 4.27 | 3.58 | 2.94 | 0.90 | 1.15 |
| Income less than $5,000 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 0.79 | 3.65 | 2.41 | 3.93 | 1.85 | * | 2.84 | 1.01 |
| 9th - 11th grade | 2.16 | 2.63 | 5.18 | 1.40 | * | * | 3.49 | 2.28 |
| 12th grade | 2.04 | * | 1.61 | 7.57 | 3.79 | ... | 5.62 | 2.53 |
| Higher than 12th grade | * | * | * | 8.65 | 6.82 | ... | 0.96 | 4.38 |
| Income of $5,000 - $9,999 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 1.77 | 0.91 | 3.07 | 4.09 | 4.06 | 4.28 | 2.83 | 1.19 |
| 9th - 11th grade | 1.24 | 3.70 | 3.42 | 20.3 | 5.73 | 2.88 | 2.26 | 2.01 |
| 12th grade | 1.26 | 2.63 | 2.93 | 4.44 | 4.19 | 2.53 | 1.54 | 1.05 |
| Higher than 12th grade | 1.87 | 1.97 | 3.56 | 5.83 | 2.07 | 3.98 | 1.78 | 1.91 |
| Income of $10,000 or more | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 3.09 | * | 6.61 | 6.65 | 7.75 | * | 2.36 | 2.37 |
| 9th - 11th grade | 1.37 | 2.73 | 4.14 | 4.92 | 6.51 | * | 4.02 | 1.25 |
| 12th grade | 1.16 | 0.34 | 1.41 | ... | 5.63 | * | 1.93 | 1.77 |
| Higher than 12th grade | 1.04 | 0.79 | 2.03 | 2.96 | 2.41 | * | 4.16 | 1.56 |

Table IX. Standard error of T-score equivalents of raw scores on the WISC and WRAT combined subtests for youths 12-17 years, by type of test, rate of population change, family income, and education of parent: United States, 1966-70

[Correspond to data presented in table 8]

| Annual family income and education of parent | WISC Composite | | | | WRAT Composite | | | |
|---|---|---|---|---|---|---|---|---|
| | Loss | Below average gain | Average gain | Above average gain | Loss | Below average gain | Average gain | Above average gain |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 1.44 | 1.65 | 1.16 | 1.18 | 1.35 | 1.20 | 1.07 | 1.35 |
| Income less than $5,000 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 1.52 | 3.93 | 0.87 | 2.29 | 1.34 | 2.52 | 0.86 | 1.79 |
| 9th - 11th grade | 2.08 | 0.88 | 2.42 | 2.57 | 2.50 | 2.18 | 1.68 | 2.34 |
| 12th grade | 1.85 | 2.31 | 2.41 | 3.27 | 2.12 | 1.85 | 2.34 | 2.93 |
| Higher than 12th grade | 9.45 | * | 6.32 | 1.70 | 7.30 | * | 8.90 | 3.56 |
| Income of $5,000-$9,999 | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 1.70 | 1.84 | 1.41 | 1.39 | 1.33 | 1.87 | 1.45 | 2.15 |
| 9th - 11th grade | 0.70 | 1.73 | 1.98 | 2.13 | 1.42 | 1.89 | 1.90 | 2.39 |
| 12th grade | 0.69 | 1.26 | 1.05 | 0.84 | 1.20 | 0.79 | 1.21 | 1.54 |
| Higher than 12th grade | 2.22 | 3.01 | 1.10 | 2.06 | 2.27 | 2.16 | 1.40 | 2.04 |
| Income of $10,000 or more | | | | | | | | |
| Education of parent: | | | | | | | | |
| Elementary school | 1.71 | 2.18 | 2.12 | 1.60 | 2.38 | 2.59 | 3.29 | 2.84 |
| 9th - 11th grade | 2.84 | 2.82 | 2.16 | 1.10 | 1.37 | 2.58 | 1.86 | 1.96 |
| 12th grade | 1.00 | 1.21 | 0.76 | 1.02 | 0.92 | 1.29 | 0.87 | 1.14 |
| Higher than 12th grade | 3.10 | 1.67 | 1.07 | 1.71 | 2.12 | 1.74 | 1.23 | 1.15 |

Table X. Standard error of T-score equivalents of raw scores on selected subtests of the WISC and WRAT for youths 12-17 years, by type of test, grade level with respect to age, family income, and education of parent: United States, 1968-70

[Correspond to data presented in table 9]

| Annual family income and education of parent | WISC Vocabulary | | | WISC Block Design | | | WRAT Reading | | | WRAT Arithmetic | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Below modal grade | In modal grade | Above modal grade | Below modal grade | In modal grade | Above modal grade | Below modal grade | In modal grade | Above modal grade | Below modal grade | In modal grade | Above modal grade |
| | Standard error of T score | | | | | | | | | | | |
| All youths, 12-17 years | 1.11 | 0.35 | 0.73 | 0.65 | 0.20 | 0.48 | 0.81 | 0.27 | 0.67 | 0.91 | 0.36 | 0.46 |
| Income less than $5,000 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 0.80 | 0.43 | 1.90 | 0.79 | 0.46 | 1.13 | 0.63 | 0.46 | 1.95 | 0.76 | 0.39 | 1.67 |
| 9th - 11th grade | 0.81 | 0.78 | 2.65 | 1.04 | 0.88 | 2.34 | 0.69 | 0.89 | 3.51 | 0.87 | 0.90 | 2.23 |
| 12th grade | 1.77 | 0.80 | 1.29 | 1.01 | 0.82 | 2.14 | 1.38 | 0.82 | 1.97 | 1.25 | 0.96 | 1.71 |
| Higher than 12th grade | 4.15 | 2.03 | * | 3.37 | 2.53 | * | 3.10 | 1.30 | * | 2.73 | 1.76 | * |
| Income of $5,000-$9,999 | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 0.91 | 0.53 | 1.41 | 0.62 | 0.76 | 1.24 | 1.22 | 0.54 | 1.01 | 0.94 | 0.59 | 0.97 |
| 9th - 11th grade | 1.60 | 0.65 | 0.89 | 0.89 | 0.59 | 1.35 | 1.29 | 0.46 | 1.08 | 1.60 | 0.75 | 1.09 |
| 12th grade | 1.03 | 0.46 | 0.65 | 0.80 | 0.24 | 0.73 | 0.80 | 0.34 | 0.81 | 1.08 | 0.44 | 0.68 |
| Higher than 12th grade | 1.47 | 0.68 | 0.98 | 1.16 | 0.60 | 1.08 | 1.08 | 0.56 | 1.35 | 1.37 | 0.65 | 1.15 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Education of parent: | | | | | | | | | | | | |
| Elementary school | 1.98 | 1.00 | 1.30 | 0.59 | 0.92 | 2.17 | 1.62 | 0.93 | 2.32 | 1.80 | 1.25 | 2.23 |
| 9th - 11th grade | 0.99 | 0.77 | 0.99 | 1.62 | 0.79 | 1.48 | 1.03 | 0.79 | 1.04 | 1.13 | 0.80 | 1.22 |
| 12th grade | 1.27 | 0.47 | 0.81 | 0.68 | 0.55 | 1.19 | 0.91 | 0.39 | 0.93 | 1.06 | 0.41 | 0.69 |
| Higher than 12th grade | 1.58 | 0.58 | 1.14 | 0.81 | 0.55 | 0.63 | 0.90 | 0.36 | 1.33 | 1.20 | 0.57 | 1.05 |

Table XI. Standard error of T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by grade level with respect to age and selected demographic or socioeconomic characteristics: United States, 1966-70

[Correspond to data presented in table 10]

| Demographic or socioeconomic characteristic | WISC Vocabulary | | | | WISC Block Design | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | Below modal grade | In modal grade | Above modal grade | Total | Below modal grade | In modal grade | Above modal grade |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.54 | 1.11 | 0.35 | 0.73 | 0.27 | 0.65 | 0.20 | 0.48 |
| Place of residence | | | | | | | | |
| Urbanized areas | 0.40 | 0.74 | 0.27 | 0.70 | 0.41 | 0.48 | 0.36 | 0.71 |
| Urban, other | 1.20 | 2.16 | 0.65 | 1.47 | 0.58 | 1.30 | 0.30 | 1.41 |
| Rural areas | 0.87 | 1.37 | 0.75 | 1.54 | 0.51 | 0.94 | 0.50 | 0.77 |
| Rate of population change | | | | | | | | |
| Loss | 1.02 | 1.88 | 0.80 | 2.56 | 0.75 | 1.87 | 0.48 | 1.31 |
| Below average gain | 1.50 | 2.15 | 0.97 | 1.07 | 0.67 | 1.25 | 0.32 | 1.31 |
| Average gain | 0.66 | 1.42 | 0.46 | 0.58 | 0.78 | 1.37 | 0.67 | 0.81 |
| Above average gain | 0.78 | 2.02 | 0.72 | 1.07 | 0.62 | 1.26 | 0.66 | 0.89 |
| Race | | | | | | | | |
| White | 0.62 | 1.24 | 0.42 | 0.79 | 0.29 | 0.63 | 0.22 | 0.47 |
| Black | 0.55 | 0.58 | 0.50 | 1.71 | 0.47 | 0.69 | 0.47 | 0.94 |
| Geographic region | | | | | | | | |
| Northeast | 0.88 | 3.33 | 0.71 | 0.74 | 0.62 | 1.71 | 0.50 | 0.70 |
| Midwest | 1.22 | 2.16 | 0.74 | 0.91 | 0.51 | 0.75 | 0.41 | 0.68 |
| South | 0.98 | 1.13 | 0.81 | 2.48 | 0.86 | 1.10 | 0.63 | 1.17 |
| West | 1.37 | 2.39 | 0.67 | 2.44 | 0.70 | 1.40 | 0.47 | 1.53 |
| Annual family income | | | | | | | | |
| Less than $5,000 | 0.64 | 0.87 | 0.43 | 1.42 | 0.41 | 0.68 | 0.41 | 1.04 |
| $5,000-$9,999 | 0.55 | 1.24 | 0.39 | 0.68 | 0.37 | 0.60 | 0.32 | 0.63 |
| $10,000 or more | 0.50 | 1.20 | 0.46 | 0.55 | 0.22 | 0.42 | 0.30 | 0.49 |

Table XII. Standard error of T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by grade level with respect to age and selected demographic or socioeconomic characteristics: United States, 1966-70

[Correspond to data presented in table 11]

| Demographic or socioeconomic characteristic | WRAT Reading | | | | WRAT Arithmetic | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | Below modal grade | In modal grade | Above modal grade | Total | Below modal grade | In modal grade | Above modal grade |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.32 | 0.81 | 0.27 | 0.67 | 0.40 | 0.91 | 0.36 | 0.46 |
| Place of residence | | | | | | | | |
| Urbanized areas | 0.39 | 0.68 | 0.40 | 0.67 | 0.32 | 0.77 | 0.33 | 0.50 |
| Urban, other | 0.58 | 1.59 | 0.29 | 1.38 | 0.82 | 1.59 | 0.62 | 2.24 |
| Rural areas | 0.64 | 1.08 | 0.61 | 1.41 | 0.80 | 1.21 | 0.76 | 1.08 |
| Rate of population change | | | | | | | | |
| Loss | 0.92 | 1.57 | 0.58 | 2.26 | 0.84 | 1.45 | 0.78 | 1.56 |
| Below average gain | 0.93 | 1.43 | 0.55 | 0.93 | 0.68 | 1.65 | 0.58 | 1.64 |
| Average gain | 0.70 | 1.67 | 0.57 | 0.93 | 0.63 | 1.89 | 0.55 | 0.45 |
| Above average gain | 0.66 | 1.78 | 0.73 | 0.82 | 1.05 | 2.58 | 0.89 | 1.16 |
| Race | | | | | | | | |
| White | 0.38 | 0.84 | 0.28 | 0.78 | 0.45 | 0.95 | 0.40 | 0.47 |
| Black | 0.31 | 0.63 | 0.48 | 1.69 | 0.48 | 0.64 | 0.48 | 1.46 |
| Geographic region | | | | | | | | |
| Northeast | 0.79 | 2.67 | 0.47 | 0.83 | 1.11 | 3.47 | 0.88 | 0.62 |
| Midwest | 0.76 | 1.40 | 0.61 | 0.55 | 1.02 | 1.97 | 0.79 | 0.89 |
| South | 0.80 | 0.91 | 0.72 | 1.88 | 0.77 | 1.02 | 0.69 | 1.80 |
| West | 0.64 | 1.70 | 0.53 | 2.32 | 0.64 | 1.90 | 0.28 | 2.44 |
| Annual family income | | | | | | | | |
| Less than $5,000 | 0.34 | 0.58 | 0.47 | 1.58 | 0.43 | 0.69 | 0.57 | 1.55 |
| $5,000-$9,999 | 0.44 | 1.07 | 0.34 | 0.56 | 0.55 | 1.24 | 0.42 | 0.36 |
| $10,000 or more | 0.31 | 0.74 | 0.31 | 0.62 | 0.44 | 0.91 | 0.47 | 0.65 |

Table XIII. Standard error of T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by type of early school attended and selected demographic or socioeconomic characteristics: United States, 1966-70

[Correspond to data presented in table 13]

| Demographic or socioeconomic characteristic | WISC Vocabulary | | | | WISC Block Design | | | |
|---|---|---|---|---|---|---|---|---|
| | Nursery school and kindergarten | Kindergarten only | Nursery school only | Neither | Nursery school and kindergarten | Kindergarten only | Nursery school only | Neither |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.52 | 0.54 | 1.92 | 0.74 | 0.46 | 0.32 | 2.09 | 0.52 |
| Education of parent | | | | | | | | |
| Elementary school | 1.74 | 0.54 | 3.52 | 0.86 | 1.14 | 0.62 | 4.70 | 0.72 |
| 9th - 11th grade | 1.35 | 0.61 | 4.10 | 0.58 | 1.27 | 0.37 | 3.29 | 0.54 |
| 12th grade | 1.18 | 0.48 | 1.81 | 0.60 | 0.69 | 0.29 | 2.17 | 0.28 |
| Higher than 12th grade | 0.57 | 0.67 | 3.10 | 1.02 | 0.93 | 0.53 | 2.06 | 0.60 |
| Annual family income | | | | | | | | |
| Less than $5,000 | 1.14 | 0.56 | 5.03 | 0.79 | 1.03 | 0.53 | 3.22 | 0.72 |
| $5,000-$9,999 | 1.06 | 0.62 | 2.37 | 0.57 | 1.00 | 0.44 | 3.11 | 0.46 |
| $10,000 or more | 0.59 | 0.63 | 1.96 | 0.53 | 0.80 | 0.26 | 2.31 | 0.43 |
| Place of residence | | | | | | | | |
| Urbanized areas | 0.62 | 0.36 | 2.03 | 0.79 | 0.57 | 0.45 | 1.83 | 0.73 |
| Urban, other | 1.07 | 1.16 | 9.63 | 1.92 | 0.84 | 0.58 | 6.02 | 0.84 |
| Rural areas | 0.80 | 1.17 | 1.80 | 0.88 | 1.01 | 0.50 | 3.33 | 0.77 |
| Rate of population change | | | | | | | | |
| Loss | 1.90 | 0.81 | 4.63 | 1.30 | 1.54 | 0.58 | 5.58 | 1.04 |
| Below average gain | 2.08 | 1.25 | 4.71 | 2.86 | 1.39 | 0.51 | 3.30 | 0.91 |
| Average gain | 1.60 | 0.55 | 3.54 | 0.80 | 1.32 | 0.68 | 2.24 | 1.15 |
| Above average gain | 0.72 | 0.83 | 2.54 | 1.12 | 0.94 | 0.67 | 3.67 | 0.73 |
| Race | | | | | | | | |
| White | 0.64 | 0.59 | 2.30 | 0.94 | 0.52 | 0.27 | 2.43 | 0.44 |
| Black | 1.09 | 0.52 | 2.33 | 0.87 | 1.11 | 0.39 | 2.06 | 0.82 |
| Geographic region | | | | | | | | |
| Northeast | 0.90 | 0.89 | 3.26 | 1.19 | 1.38 | 0.77 | 2.68 | 0.88 |
| Midwest | 0.56 | 1.18 | 0.37 | 2.12 | 0.88 | 0.60 | 3.20 | 0.77 |
| South | 0.85 | 0.67 | 1.07 | 0.74 | 0.40 | 0.88 | 2.50 | 0.81 |
| West | 1.24 | 0.70 | 7.93 | 2.83 | 1.00 | 0.45 | 7.76 | 1.12 |

Table XIV. Standard error of T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by type of early school attended and selected demographic or socioeconomic characteristics: United States, 1966-70

[Correspond to data presented in table 14]

| Demographic or socioeconomic characteristic | WRAT Reading | | | | WRAT Arithmetic | | | |
|---|---|---|---|---|---|---|---|---|
| | Nursery school and kindergarten | Kindergarten only | Nursery school only | Neither | Nursery school and kindergarten | Kindergarten only | Nursery school only | Neither |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.56 | 0.35 | 1.88 | 0.43 | 0.50 | 0.46 | 1.33 | 0.55 |
| Education of parent | | | | | | | | |
| Elementary school | 1.45 | 0.54 | 4.84 | 0.49 | 1.21 | 0.62 | 5.33 | 0.66 |
| 9th - 11th grade | 1.47 | 0.53 | 3.41 | 0.58 | 1.67 | 0.61 | 2.42 | 0.59 |
| 12th grade | 1.11 | 0.34 | 1.74 | 0.45 | 0.84 | 0.51 | 1.92 | 0.55 |
| Higher than 12th grade | 0.61 | 0.38 | 4.49 | 0.82 | 0.74 | 0.52 | 4.65 | 1.07 |
| Annual family income | | | | | | | | |
| Less than $5,000 | 0.87 | 0.53 | 3.29 | 0.49 | 0.96 | 0.49 | 1.62 | 0.72 |
| $5,000-$9,999 | 1.01 | 0.53 | 2.43 | 0.48 | 0.91 | 0.63 | 1.83 | 0.60 |
| $10,000 or more | 0.65 | 0.40 | 3.00 | 0.50 | 0.59 | 0.49 | 3.10 | 0.80 |
| Place of residence | | | | | | | | |
| Urbanized areas | 0.79 | 0.36 | 2.26 | 0.74 | 0.61 | 0.32 | 1.28 | 0.59 |
| Urban, other | 1.29 | 0.47 | 7.63 | 0.67 | 1.21 | 1.05 | 4.93 | 0.68 |
| Rural areas | 1.01 | 0.83 | 1.61 | 0.65 | 1.14 | 1.08 | 2.48 | 0.85 |
| Rate of population change | | | | | | | | |
| Loss | 2.33 | 0.93 | 3.78 | 1.04 | 1.88 | 0.74 | 4.25 | 1.37 |
| Below average gain | 2.63 | 0.87 | 7.33 | 1.41 | 1.72 | 0.72 | 3.12 | 1.13 |
| Average gain | 1.47 | 0.47 | 2.00 | 0.78 | 1.53 | 0.40 | 2.20 | 0.62 |
| Above average gain | 0.81 | 0.59 | 2.07 | 1.05 | 0.53 | 1.11 | 2.17 | 1.34 |
| Race | | | | | | | | |
| White | 0.61 | 0.37 | 2.23 | 0.47 | 0.59 | 0.48 | 1.73 | 0.65 |
| Black | 0.98 | 0.61 | 0.96 | 0.69 | 1.14 | 0.49 | 1.37 | 0.92 |
| Geographic region | | | | | | | | |
| Northeast | 1.25 | 0.78 | 4.41 | 1.14 | 1.46 | 1.14 | 1.88 | 1.14 |
| Midwest | 0.64 | 0.67 | 5.33 | 1.49 | 1.02 | 0.94 | 5.09 | 2.13 |
| South | 0.76 | 0.66 | 1.54 | 0.44 | 0.84 | 0.50 | 1.56 | 0.55 |
| West | 1.23 | 0.41 | 5.82 | 1.11 | 0.48 | 0.46 | 5.68 | 1.28 |

Table XV. Standard error of T-score equivalents of raw scores on the WISC Vocabulary and Block Design subtests for youths 12-17 years, by age they started first grade and selected demographic or socioeconomic characteristics: United States, 1966-70

[Correspond to data presented in table 15]

| Demographic or socioeconomic characteristic | WISC Vocabulary | | | | WISC Block Design | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | 5 years or under | 6 years | 7 years or over | Total | 5 years or under | 6 years | 7 years or over |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.54 | 0.51 | 0.51 | 1.20 | 0.27 | 0.39 | 0.32 | 0.77 |
| **Grade level for age** | | | | | | | | |
| Above modal grade | 0.73 | 0.74 | 1.01 | * | 0.48 | 0.55 | 0.61 | * |
| In modal grade | 0.35 | 0.52 | 0.32 | 0.85 | 0.20 | 0.44 | 0.25 | 0.83 |
| Below modal grade | 1.11 | 0.73 | 1.12 | 1.23 | 0.65 | 0.51 | 0.71 | 0.82 |
| **Education of parent** | | | | | | | | |
| Elementary school | 0.66 | 0.57 | 0.61 | 1.16 | 0.49 | 0.76 | 0.59 | 1.09 |
| 9th - 11th grade | 0.50 | 0.93 | 0.51 | 1.20 | 0.28 | 0.77 | 0.37 | 1.02 |
| 12th grade | 0.39 | 0.61 | 0.40 | 0.98 | 0.18 | 0.56 | 0.19 | 1.09 |
| Higher than 12th grade | 0.54 | 0.80 | 0.56 | 2.04 | 0.36 | 0.60 | 0.42 | 1.24 |
| **Annual family income** | | | | | | | | |
| Less than $5,000 | 0.64 | 0.56 | 0.59 | 1.21 | 0.46 | 0.55 | 0.53 | 1.43 |
| $5,000-$9,999 | 0.55 | 0.75 | 0.52 | 1.18 | 0.40 | 0.66 | 0.37 | 1.09 |
| $10,000 or more | 0.50 | 0.62 | 0.57 | 1.30 | 0.21 | 0.33 | 0.28 | 1.02 |
| **Place of residence** | | | | | | | | |
| Urbanized areas | 0.40 | 0.48 | 0.41 | 0.70 | 0.41 | 0.56 | 0.41 | 0.74 |
| Urban, other | 1.20 | 1.15 | 1.09 | 2.09 | 0.58 | 1.17 | 0.59 | 2.11 |
| Rural areas | 0.87 | 0.93 | 0.85 | 1.65 | 0.51 | 0.50 | 0.54 | 1.41 |
| **Rate of population change** | | | | | | | | |
| Loss | 1.02 | 1.38 | 1.06 | 1.24 | 0.75 | 0.83 | 0.84 | 1.59 |
| Below average gain | 1.50 | 1.43 | 1.27 | 4.46 | 0.67 | 0.71 | 0.66 | 3.02 |
| Average gain | 0.66 | 0.36 | 0.72 | 1.08 | 0.78 | 0.81 | 0.88 | 1.38 |
| Above average gain | 0.78 | 0.80 | 0.73 | 1.44 | 0.62 | 0.70 | 0.61 | 1.10 |
| **Race** | | | | | | | | |
| White | 0.62 | 0.61 | 0.57 | 1.60 | 0.29 | 0.35 | 0.27 | 0.94 |
| Black | 0.55 | 0.80 | 0.57 | 1.23 | 0.47 | 0.64 | 0.52 | 1.12 |
| **Geographic region** | | | | | | | | |
| Northeast | 0.88 | 0.90 | 0.93 | 1.50 | 0.62 | 0.95 | 0.56 | 1.19 |
| Midwest | 1.22 | 1.48 | 1.17 | 1.32 | 0.51 | 0.83 | 0.47 | 1.37 |
| South | 0.98 | 1.11 | 0.94 | 0.84 | 0.86 | 0.75 | 0.87 | 1.33 |
| West | 1.37 | 0.46 | 1.26 | 4.14 | 0.70 | 0.55 | 0.64 | 2.23 |

Table XVI. Standard error of T-score equivalents of raw scores on the WRAT Reading and Arithmetic subtests for youths 12-17 years, by age they started first grade and selected demographic or socioeconomic characteristics: United States, 1966-70

[Correspond to data presented in table 16]

| Demographic or socioeconomic characteristic | WRAT Reading | | | | WRAT Arithmetic | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | 5 years or under | 6 years | 7 years or over | Total | 5 years or under | 6 years | 7 years or over |
| | Standard error of T score | | | | | | | |
| All youths, 12-17 years | 0.32 | 0.47 | 0.33 | 0.76 | 0.40 | 0.52 | 0.41 | 0.71 |
| Grade level for age | | | | | | | | |
| Above modal grade | 0.67 | 0.73 | 0.93 | * | 0.46 | 0.60 | 0.73 | * |
| In modal grade | 0.27 | 0.42 | 0.27 | 1.20 | 0.36 | 0.57 | 0.34 | 1.43 |
| Below modal grade | 0.81 | 0.83 | 0.83 | 0.79 | 0.91 | 0.56 | 0.98 | 0.78 |
| Education of parent | | | | | | | | |
| Elementary school | 0.38 | 0.78 | 0.40 | 0.94 | 0.44 | 0.77 | 0.46 | 0.91 |
| 9th - 11th grade | 0.36 | 0.88 | 0.49 | 1.12 | 0.47 | 0.84 | 0.54 | 1.10 |
| 12th grade | 0.30 | 0.54 | 0.31 | 1.42 | 0.42 | 0.60 | 0.46 | 1.34 |
| Higher than 12th grade | 0.32 | 0.64 | 0.34 | 1.37 | 0.54 | 0.80 | 0.55 | 1.06 |
| Annual family income | | | | | | | | |
| Less than $5,000 | 0.37 | 0.64 | 0.43 | 0.52 | 0.44 | 0.65 | 0.56 | 1.11 |
| $5,000-$9,999 | 0.46 | 0.87 | 0.39 | 1.21 | 0.55 | 0.74 | 0.55 | 0.76 |
| $10,000 or more | 0.30 | 0.47 | 0.42 | 1.75 | 0.44 | 0.60 | 0.51 | 1.38 |
| Place of residence | | | | | | | | |
| Urbanized areas | 0.39 | 0.64 | 0.37 | 0.88 | 0.32 | 0.55 | 0.28 | 0.66 |
| Urban, other | 0.58 | 0.77 | 0.52 | 1.85 | 0.82 | 1.13 | 0.81 | 1.22 |
| Rural areas | 0.64 | 0.74 | 0.66 | 1.37 | 0.80 | 1.00 | 0.82 | 1.19 |
| Rate of population change | | | | | | | | |
| Loss | 0.92 | 1.63 | 0.93 | 1.21 | 0.84 | 1.29 | 1.02 | 1.70 |
| Below average gain | 0.93 | 1.14 | 0.85 | 3.00 | 0.68 | 0.87 | 0.67 | 2.86 |
| Average gain | 0.70 | 0.57 | 0.72 | 1.55 | 0.63 | 0.49 | 0.64 | 1.56 |
| Above average gain | 0.66 | 0.66 | 0.64 | 1.26 | 1.05 | 1.07 | 1.03 | 1.36 |
| Race | | | | | | | | |
| White | 0.38 | 0.51 | 0.35 | 0.86 | 0.45 | 0.53 | 0.46 | 0.97 |
| Black | 0.31 | 0.72 | 0.33 | 1.23 | 0.48 | 0.59 | 0.52 | 1.30 |
| Geographic region | | | | | | | | |
| Northeast | 0.79 | 1.16 | 0.79 | 0.48 | 1.11 | 1.18 | 1.14 | 1.09 |
| Midwest | 0.76 | 1.03 | 0.73 | 1.04 | 1.02 | 1.14 | 1.06 | 1.19 |
| South | 0.80 | 1.04 | 0.74 | 1.00 | 0.77 | 1.06 | 0.78 | 1.06 |
| West | 0.64 | 0.56 | 0.58 | 2.08 | 0.64 | 0.90 | 0.55 | 1.90 |

Table XVII. Standard error of T-score equivalents of raw scores on selected and combined subtests of the WISC and the WRAT for youths 12-17 years, by race, family income, and education of parent: United States, 1966-70

[Correspond to data presented in table 17]

| Annual family income and education of parent | WISC | | | | | | WRAT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Vocabulary | | Block Design | | Composite | | Reading | | Arithmetic | | Composite | |
| | White | Black | White | Black | White | Black | White | Black | White | Black | White | Black |
| | Standard error of T score | | | | | | | | | | | |
| All youths 12-17 years | 0.62 | 0.55 | 0.29 | 0.47 | 0.76 | 0.81 | 0.38 | 0.31 | 0.45 | 0.48 | 0.65 | 0.62 |
| Income less than $5,000 | | | | | | | | | | | | |
| Elementary school | 1.15 | 0.76 | 0.45 | 0.68 | 1.19 | 1.18 | 0.49 | 0.43 | 0.43 | 0.83 | 0.70 | 1.01 |
| 9th - 11th grade | 0.86 | 0.78 | 0.67 | 1.07 | 1.02 | 1.34 | 0.93 | 0.46 | 0.96 | 0.50 | 1.46 | 0.62 |
| 12th grade | 0.89 | 1.51 | 0.75 | 0.80 | 1.22 | 1.82 | 0.80 | 1.16 | 0.79 | 0.76 | 1.15 | 1.41 |
| Higher than 12th grade | 1.68 | 2.53 | 1.85 | 1.67 | 2.19 | 3.05 | 1.87 | 2.65 | 1.77 | 1.95 | 2.81 | 3.38 |
| Income of $5,000 - $9,999 | | | | | | | | | | | | |
| Elementary school | 0.57 | 0.67 | 0.80 | 0.80 | 1.04 | 0.80 | 0.54 | 0.86 | 0.61 | 0.83 | 0.91 | 1.33 |
| 9th - 11th grade | 0.81 | 1.37 | 0.48 | 0.85 | 1.05 | 1.60 | 0.67 | 0.65 | 0.93 | 0.62 | 1.24 | 0.99 |
| 12th grade | 0.46 | 1.33 | 0.30 | 1.41 | 0.50 | 1.97 | 0.37 | 1.37 | 0.51 | 1.57 | 0.66 | 2.09 |
| Higher than 12th grade | 0.65 | 3.00 | 0.57 | 2.24 | 0.99 | 4.24 | 0.48 | 4.08 | 0.72 | 2.16 | 0.90 | 5.06 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Elementary school | 0.87 | 3.11 | 0.62 | 3.75 | 0.68 | 3.97 | 0.90 | 3.68 | 0.98 | 2.01 | 1.44 | 4.66 |
| 9th - 11th grade | 0.61 | * | 0.70 | * | 0.83 | * | 0.51 | * | 0.66 | * | 0.90 | * |
| 12th grade | 0.51 | 2.35 | 0.30 | 2.64 | 0.51 | 4.24 | 0.45 | 3.95 | 0.37 | 2.25 | 0.58 | 5.17 |
| Higher than 12th grade | 0.58 | 1.17 | 0.44 | 1.86 | 0.83 | 1.99 | 0.32 | 2.03 | 0.56 | 1.50 | 0.64 | 2.83 |

Table XVIII. Standard error of T-score equivalents of raw scores on the WISC Vocabulary and Block Design and combined subtests for youths 12-17 years, by geographic region, family income, and education of parent: United States, 1966-70

[Correspond to data presented in table 18]

| Annual family income and education of parent | WISC Vocabulary | | | | WISC Block Design | | | | WISC Composite | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North-east | Mid-west | South | West | North-east | Mid-west | South | West | North-east | Mid-west | South | West |
| | Standard error of T score | | | | | | | | | | | |
| All youths, 12-17 years | 0.88 | 1.22 | 0.98 | 1.37 | 0.62 | 0.51 | 0.86 | 0.70 | 1.23 | 1.47 | 1.55 | 1.71 |
| Income less than $5,000 | | | | | | | | | | | | |
| Elementary school | 0.87 | 1.89 | 0.52 | 3.64 | 1.06 | 1.47 | 0.54 | 1.76 | 1.39 | 2.66 | 0.76 | 4.45 |
| 9th - 11th grade | 1.69 | 2.05 | 0.79 | 1.29 | 1.74 | 0.49 | 0.82 | 1.92 | 2.88 | 1.79 | 1.02 | 1.91 |
| 12th grade | 1.53 | 2.86 | 2.02 | 0.72 | 1.44 | 2.24 | 1.25 | 0.36 | 2.44 | 4.35 | 2.38 | 0.66 |
| Higher than 12th grade | 3.66 | 1.72 | 2.86 | 5.25 | 1.95 | 4.99 | 1.84 | 2.37 | 3.79 | 4.52 | 3.80 | 6.20 |
| Income of $5,000-$9,999 | | | | | | | | | | | | |
| Elementary school | 1.15 | 1.38 | 0.87 | 0.99 | 1.07 | 0.85 | 0.74 | 2.35 | 1.81 | 1.84 | 1.34 | 2.46 |
| 9th - 11th grade | 0.76 | 2.65 | 0.65 | 1.68 | 0.53 | 1.47 | 1.02 | 1.35 | 1.03 | 3.51 | 1.37 | 2.41 |
| 12th grade | 0.76 | 1.22 | 0.67 | 0.51 | 0.57 | 0.58 | 0.57 | 0.75 | 0.81 | 1.36 | 0.70 | 0.87 |
| Higher than 12th grade | 1.82 | 1.76 | 0.89 | 1.38 | 2.11 | 1.26 | 0.58 | 0.73 | 3.25 | 2.46 | 1.09 | 1.68 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Elementary school | 2.05 | 1.60 | 1.79 | 3.25 | 2.37 | 0.96 | 1.93 | 2.57 | 2.67 | 1.04 | 2.51 | 3.10 |
| 9th - 11th grade | 2.25 | 0.94 | 1.42 | 1.15 | 1.73 | 1.19 | 1.85 | 1.19 | 1.99 | 1.76 | 2.43 | 1.62 |
| 12th grade | 0.87 | 0.89 | 1.49 | 0.79 | 0.61 | 0.43 | 0.93 | 0.56 | 1.21 | 0.57 | 1.30 | 1.08 |
| Higher than 12th grade | 1.70 | 0.82 | 0.76 | 0.90 | 1.47 | 0.69 | 0.69 | 0.51 | 2.58 | 1.18 | 1.19 | 1.07 |

Table XIX. Standard error of T-score equivalents of raw scores on the WRAT Arithmetic and Reading and combined subtests for youths 12-17 years, by geographic region, family income, and education of parent: United States, 1966-70

[Correspond to data presented in table 19]

| Annual family income and education of parent | WRAT Reading | | | | WRAT Arithmetic | | | | WRAT Composite | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | North-east | Mid-west | South | West | North-east | Mid-west | South | West | North-east | Mid-west | South | West |
| | Standard error of T score | | | | | | | | | | | |
| All youths, 12-17 years | 0.79 | 0.76 | 0.80 | 0.64 | 1.11 | 1.02 | 0.77 | 0.64 | 1.52 | 1.42 | 1.27 | 0.99 |
| Income less than $5,000 | | | | | | | | | | | | |
| Elementary school | 0.89 | 1.16 | 0.20 | 2.11 | 1.33 | 1.53 | 0.33 | 1.53 | 1.77 | 2.06 | 0.39 | 2.78 |
| 9th - 11th grade | 1.40 | 1.85 | 0.66 | 1.63 | 1.42 | 1.60 | 1.06 | 0.99 | 2.20 | 2.75 | 1.19 | 2.04 |
| 12th grade | 2.38 | 1.69 | 1.03 | 1.21 | 1.82 | 2.91 | 0.87 | 0.81 | 3.40 | 3.79 | 1.52 | 1.39 |
| Higher than 12th grade | 4.11 | 1.95 | 2.25 | 6.46 | 2.48 | 6.59 | 2.75 | 3.95 | 4.88 | 6.87 | 3.96 | 8.33 |
| Income of $5,000-$9,999 | | | | | | | | | | | | |
| Elementary school | 1.33 | 1.37 | 0.95 | 0.51 | 1.42 | 1.39 | 1.01 | 0.39 | 2.19 | 2.20 | 1.44 | 0.50 |
| 9th - 11th grade | 1.00 | 1.80 | 0.86 | 1.17 | 0.98 | 2.78 | 0.86 | 1.27 | 1.46 | 3.65 | 1.32 | 1.96 |
| 12th grade | 0.72 | 0.75 | 0.27 | 0.54 | 0.98 | 1.47 | 0.60 | 0.78 | 1.37 | 1.70 | 0.59 | 0.98 |
| Higher than 12th grade | 1.38 | 0.66 | 0.95 | 0.70 | 2.12 | 1.84 | 0.99 | 1.15 | 2.62 | 1.82 | 1.50 | 1.32 |
| Income of $10,000 or more | | | | | | | | | | | | |
| Elementary school | 2.61 | 1.68 | 2.23 | 1.78 | 1.98 | 1.58 | 2.67 | 2.29 | 3.77 | 2.44 | 3.54 | 2.97 |
| 9th - 11th grade | 1.43 | 1.08 | 1.05 | 1.04 | 1.77 | 1.32 | 1.25 | 1.53 | 2.60 | 1.79 | 1.61 | 1.98 |
| 12th grade | 0.62 | 0.76 | 1.07 | 0.75 | 1.01 | 0.52 | 0.89 | 0.75 | 1.19 | 1.02 | 1.41 | 0.89 |
| Higher than 12th grade | 0.88 | 0.54 | 0.67 | 0.70 | 1.52 | 0.81 | 0.91 | 0.82 | 1.67 | 0.90 | 1.17 | 1.16 |

○○○

# APPENDIX III

# DEMOGRAPHIC AND SOCIOECONOMIC VARIABLES

*Age.*—The age recorded for each youth was age at last birthday as of the date of examination. Age was confirmed by comparison with the date of birth on the youth's birth certificate. The age criterion for inclusion in the sample was the age at the time of the first interview. Since the examination usually took place 2 to 4 weeks after the interview, some youths who were 17 years old at the time of interview became 18 years old by the time of examination. There were 58 such cases. In the adjustment and weighting procedures and in the analysis, these youths were included in the 17-year-old group.

*Grade.*—The grade placement of sample youths was obtained from the questionnaire sent to the schools they attended. If educational level was not available from the school questionnaire, grade placement or the fact of having completed or left school was determined from information noted by examiners on one of the psychological test record forms. For youths on summer vacation, the grade placement recorded was the grade the youth would enter in the fall. Those included in the "more than high school education" category are youths who were enrolled in colleges or training programs beyond high school level or youths on summer vacation after high school graduation who planned to continue their education in the fall.

*Race.*—Race was recorded as "white," "Negro," or "other." The last category included American Indians, Chinese, Japanese, and all races other than white or Negro. Mexican persons were included with "white" unless definitely known to be American Indian or of another race. Negroes and persons of mixed Negro and other parentage were recorded as "Negro." The term "Negro" has been replaced by "black" in this report. Adolescents recorded as "other" comprised less than 1 percent of the sample and were excluded from the detailed presentations.

*Geographic region.*—For purposes of stratification, the United States was divided into four broad geographic regions of approximately equal population. These regions, which correspond closely to those used by the U.S. Bureau of the Census, were as follows:

| *Region* | *States Included* |
|---|---|
| Northeast . . . . | Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania. |
| Midwest . . . . . | Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, and Missouri. |
| South . . . . . | Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas. |
| West . . . . . | Washington, Oregon, California, Nevada, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii. |

*Education of parent or guardian.*—The highest grade completed in school was recorded. The only grades counted were those attended in a regular public or private school where persons were given formal education, whether during the day or at night and whether attendance was full or part time. A "regular" school is one which advances a person toward an elementary or high school diploma, or a college, university, or professional school degree. Education in vocational, trade, or business schools outside the regular school system was not counted in determining the highest grade of school completed.

*Family income.*—The income recorded was the total income received during the past 12 months by the head of the household and all other household members related to the head by blood, marriage, or adoption. This income was the gross cash income (excluding pay in kind) except in the case of a family with its own farm or business, in which case net income was recorded.

*Parent.*—A parent was the natural parent or, in the case of adoption, the legal parent of the child.

*Guardian.*—A guardian was responsible for the care and supervision of the child. He (or she) did not have to be the legal guardian to be considered the guardian for this survey. A guardianship could only exist when the parent(s) of the child did not reside within the sample household.

*Head of household.*—Only one person in each household was designated as the "head." He (or she) was the person who was regarded as the "head" by the members of the household. In most cases the head was the chief breadwinner of the family, although this was not always true. In some cases the head was the parent of the chief earner or the only adult member of the household.

☆U.S. GOVERNMENT PRINTING OFFICE: 1977—241-180:4

## VITAL AND HEALTH STATISTICS PUBLICATIONS SERIES

*Formerly Public Health Service Publication No. 1000*

*Series 1. Programs and Collection Procedures.*—Reports which describe the general programs of the National Center for Health Statistics and its offices and divisions, data collection methods used, definitions, and other material necessary for understanding the data.

*Series 2. Data Evaluation and Methods Research.*—Studies of new statistical methodology including experimental tests of new survey methods, studies of vital statistics collection methods, new analytical techniques, objective evaluations of reliability of collected data, contributions to statistical theory.

*Series 3. Analytical Studies.*—Reports presenting analytical or interpretive studies based on vital and health statistics, carrying the analysis further than the expository types of reports in the other series.

*Series 4. Documents and Committee Reports.*—Final reports of major committees concerned with vital and health statistics, and documents such as recommended model vital registration laws and revised birth and death certificates.

*Series 10. Data from the Health Interview Survey.*—Statistics on illness, accidental injuries; disability; use of hospital, medical, dental, and other services; and other health-related topics, based on data collected in a continuing national household interview survey.

*Series 11. Data from the Health Examination Survey.*—Data from direct examination, testing, and measurement of national samples of the civilian, noninstitutionalized population provide the basis for two types of reports: (1) estimates of the medically defined prevalence of specific diseases in the United States and the distributions of the population with respect to physical, physiological, and psychological characteristics; and (2) analysis of relationships among the various measurements without reference to an explicit finite universe of persons.

*Series 12. Data from the Institutionalized Population Surveys.*—Discontinued effective 1975. Future reports from these surveys will be in Series 13.

*Series 13. Data on Health Resources Utilization.*—Statistics on the utilization of health manpower and facilities providing long-term care, ambulatory care, hospital care, and family planning services.

*Series 14. Data on Health Resources: Manpower and Facilities.*—Statistics on the numbers, geographic distribution, and characteristics of health resources including physicians, dentists, nurses, other health occupations, hospitals, nursing homes, and outpatient facilities.

*Series 20. Data on Mortality.*—Various statistics on mortality other than as included in regular annual or monthly reports. Special analyses by cause of death, age, and other demographic variables; geographic and time series analyses; and statistics on characteristics of deaths not available from the vital records, based on sample surveys of those records.

*Series 21. Data on Natality, Marriage, and Divorce.*—Various statistics on natality, marriage, and divorce other than as included in regular annual or monthly reports. Special analyses by demographic variables; geographic and time series analyses; studies of fertility; and statistics on characteristics of births not available from the vital records, based on sample surveys of those records.

*Series 22. Data from the National Mortality and Natality Surveys.*—Discontinued effective 1975. Future reports from these sample surveys based on vital records will be included in Series 20 and 21, respectively.

*Series 23. Data from the National Survey of Family Growth.*—Statistics on fertility, family formation and dissolution, family planning, and related maternal and infant health topics derived from a biennial survey of a nationwide probability sample of ever-married women 15-44 years of age.

For a list of titles of reports published in these series, write to: Scientific and Technical Information Branch
National Center for Health Statistics
Public Health Service, HRA
Rockville, Md. 20857